

SIR WILLIAM GOWERS



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[Frontispiece

SIR WILLIAM GOWERS

1845-1915

A BIOGRAPHICAL APPRECIATION

By
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PREFACE

Not long ago, an anonymous book-reviewer in a medical journal proclaimed that "... clinical medicine, like patriotism, is not enough, and the day of the elegant series of clinical lectures is gone. We may regret the passing of good showmanship in the out-patient department, the charming eloquence in the lecture-room, and the elegant phrase in writing. . . ." If such is really the case—and I for one will not agree for a moment—it is indeed to be deplored. But perhaps, like Rip Van Winkle, I have been unaware of the slipping-by of an epoch in medical education. If so, the time is over-ripe for us to consider one of the supreme exponents of the polished lecture, the well-turned phrase. Consequently, in a somewhat sentimental *recherche du temps perdu*, I have embarked upon an account of Sir William Gowers, that great Victorian neurologist.

"The writing of a biography is no facile task ; it is the strenuous achievement of a lifetime, only to be accomplished in the face of endless obstacles and unspeakable prejudice." This is the warning which Havelock Ellis gave to those who aspire to narrate the life and work of some individual or personage. His "open letter to biographers" may well be regarded as a desirable if not an essential preliminary reading to all such literary attempts. With some feeling he stressed the faults of those historians who, while telling so many things the reader has no desire to know, are silent upon so much that might have been said. Ellis would seek to learn while reading the life history of a man of genius,

what were the origins of this tremendous energy, the forces that gave it impetus and that drove it into one channel rather than another. Too often instead the reader is regaled with a mere chatter about his deeds, which if real enough are capable of speaking for themselves. By glossing over the weaknesses—as the valet-moralist might regard them—the biographer may find himself reduced to the production of a “figure that is smooth, decorous, conventional, *bien coiffé*, above all, closely cut off below the waist, such a figure as we may gaze at without a blush in the hair-dresser’s window.”

Reading these counsels, I am only too conscious of deserving many of Havelock Ellis’ strictures. Some of the shortcomings of this volume may be explained by the peculiar difficulties in gathering objective material. Gowers was not a man with a wide circle of professional friends and correspondents. He was reserved and apparently difficult to know. Warmness and conviviality were foreign to him and he remained among his colleagues a lonely and unapproachable figure, admired but not understood.

Consequently the subject-matter of this biography has been gathered mainly from Gowers’ own medical writings. To these must be added the personal recollections of a number of his junior contemporaries, and a diminishing but still considerable stock of tradition at his old hospital in Queen Square.

For such help in this modest biography I am grateful to many of his former disciples, such as Stanley Barnes, Edwin Bramwell, Wilfred Harris, Gordon Holmes, Purves Stewart, Foster Kennedy and C. E. Finney. In addition to assistance of this kind, I have received considerable stimulus from two persons who were in particularly close relationship to Gowers : I refer to Mrs. James Taylor and to Sir Ernest Gowers. For their kind-

ness and encouragement I offer my most sincere thanks.

Grateful acknowledgment is also due to Dr. Reinhold for help with the bibliography, to the Reverend V. K. C. Logan, Rector of Hackney, and the Reverend F. N. Brown, Vicar of Coggeshall, for topographical data and illustrations.

January, 1949.

M.C.

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familiar enough to that generation which included James Taylor, Risien Russell, Collier, Bramwell, Farquhar Buzzard, Holmes, Barnes, Wilfred Harris, Kinnier Wilson, all of whom had been his pupils or assistants. It would be unfortunate if younger men, both in Great Britain and abroad, were to take for granted some of these accomplishments, or to remain in ignorance of exactly how much he achieved.

Not only have the writings and doctrines of Gowers a particular attraction, but the complex personality of this great man was equally stimulating. Fourteen or fifteen years ago, the late Sir Arthur Hurst was deploring that no one had ever ventured a biography of Gowers. His brilliant achievements, he believed, had never quite received their full measure of recognition, unlike Hughlings Jackson, whose merits had never been forgotten, and whose appraisal was universal.

Except for Gowers' own writings, documentation is scant. Shortly before the war Collier gave his fascinating FitzPatrick Lectures upon the Development of Neurology in the 19th Century, in which Gowers figures prominently. But Collier's sudden demise occurred before publication was possible and his manuscript is now lost. The lectures are therefore unknown to all save the handful who gathered within the auditorium of the Royal College of Physicians. Risien Russell's presidential address to the Neurological Section of the Royal Society of Medicine in 1932 also touched upon Gowers, but here again the lecture was never printed.

EARLY DAYS

*“ Vom Vater hab Ich die Statur
Des Lebens ernstes Führen
Vom Mutterchen die Frohnatur
Und Lust zu fabulieren.”*

—GOETHE.

THE origins of his family are uncertain but are probably to be found in Holland. For two centuries at the very least they had settled in Essex and the eastern environs of London. In 1715, a George Gowers married one Anne Scott at Christ Church, Hackney. One hundred and twenty years later, a descendant, William Gowers, married Ann Venables of Headington, Oxford, and set up business in Church Street, Hackney, as a maker and retailer of shoes. His brother worked in Victoria Street nearby as a carman.

Hackney was at that time an expanding and prosperous village—the Gowers' shop stood immediately opposite the church a few doors from the Eight Bells tavern. When Church Street was widened to form the present-day Mare Street, this row of houses was demolished and Gowers' shop was rebuilt as a new hostelry at the corner of Amhurst Road, the Railway Inn. This name celebrated the construction of the railway across the road, an innovation which took place in 1850. During the second German war the Railway Inn and adjacent properties were much damaged by an air attack.

William Richard Gowers was born at this little shop on March 20, 1845. His first schooling probably took place at that interesting foundation—the Hackney Free and Parochial Schools in Chatham Place. The Free School

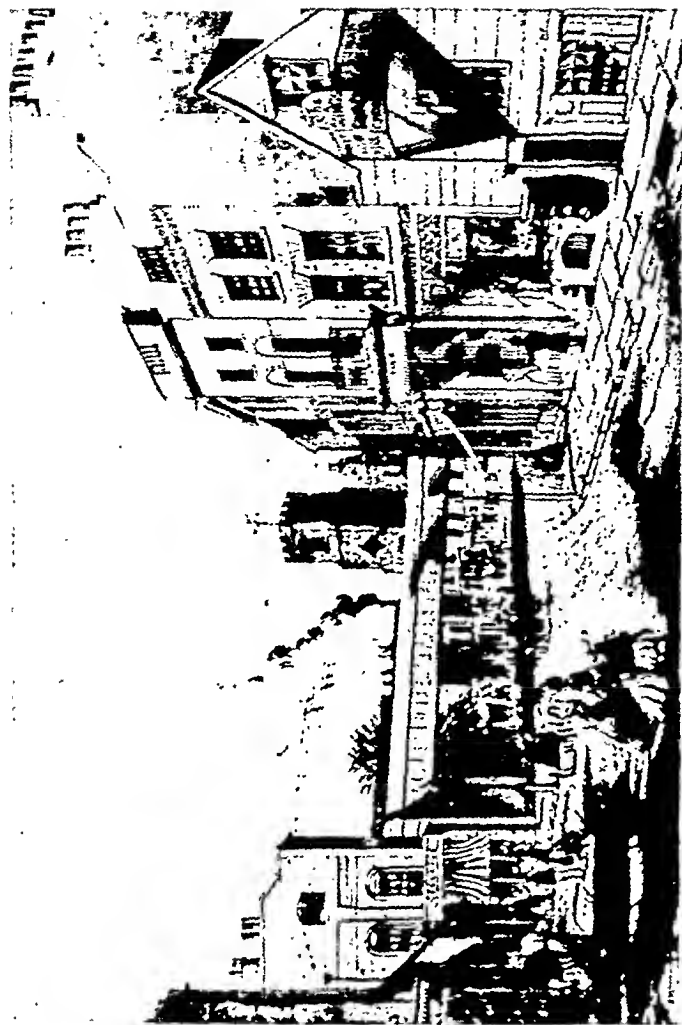
originated in 1520 and the Parochial School in 1714; they were united in 1771. These schools have been described as the "Eton of the East End".

At the early age of eleven, William lost his father. The business was sold to one William Hopper, and his mother took him home to her folk at Headington. By very great fortune William was granted a place as scholar of Christ Church College School, where he remained until 1860, that is until he was fifteen years of age.

We know little of his scholastic career for the mid-century college records have been destroyed. But he must have been no ordinary pupil, for from these few years of tuition he gained an adequate acquaintance of French, German and Latin; a mastery of incisive English of peculiar beauty and clarity; and a most elegant penmanship. Somewhere and at some period, he also contrived to teach himself shorthand; to pick up the rudiments of natural history which later developed into a deep botanical knowledge, and lastly to practise drawing, painting and the art of etching.

What awards and prizes fell to him we do not know. Nor are we certain why his school days should have ended at such a comparatively early age, though we may guess at the stringency of his widowed mother's circumstances. Leaving school at fifteen, he went for some months to work upon a farm in Bentley, Yorkshire, but it was obvious that his ambitions lay elsewhere.

In 1861 we find him among relatives at Coggeshall in Essex where the local medical practitioner, Dr. Thomas Simpson, happened to offer young William, more in jest than in seriousness, the rôle of apprentice. The offer was accepted—whether with alacrity or with due deliberation—we do not know, or, indeed, whether with a measure of reluctance. Somchow or other the necessary £150 was found and put up, and William Richard Gowers embarked



Tudor Jones & Co.

Church Street, Hackney, as it was between 1850 and 1870 (from an old print). The Gowers' shop was one of the row facing the Church.

upon his two-years' pupilage with the doctor at Derwent House, Coggeshall.

His diary written at that period still exists and forms an interesting social document, revealing the life of a country doctor's apprentice during the middle of the 19th century. Written in a most beautiful shorthand it opens with the sentences . . . "Longhand is not calculated for journal keeping, at any rate not so much as phonography; and so I intend to keep one regularly in shorthand, which I now begin, commencing my entry every night at 10 o'clock. This writing will give it the great advantage of secrecy from all other members of the household."

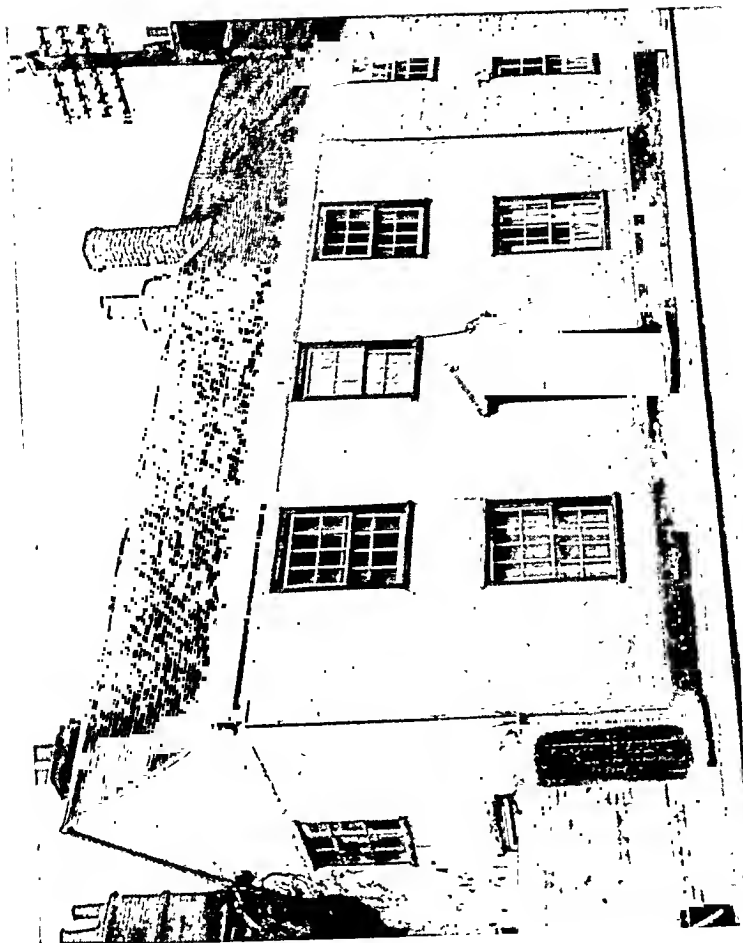
Gowers' chief duties as apprentice were to dispense medicines and to drive the gig. In addition he studied for the London Matriculation which he passed in the first division in January 1863. Even with this obstacle behind him he continued with his general education, studying mainly before breakfast. The following entry describes a typical day—except perhaps for the latter part:

"Monday, June 8, 1863. By means of going to bed at an early hour last night—namely 10 o'clock—I fortunately woke at about five, and didn't lose much time in getting out of bed and my clothes on and myself in my surgery chair—distinguished from the others by means of a small square cushion—and to work. On the whole, with the exception of the evening, I think I can consider this day a pretty good one. I did mathematics until nearly 6.30, and then a little of an Ode of Horace, until seven, and then German until breakfast. After breakfast, my specimens, the surgery, and the arranging of a glass tube in a cork for a castor oil bottle in the surgery took up my time until eleven, when I did a little chemistry and botany for about an hour and a half, when Mrs. Simpson suddenly came in and asked me to drive her to Braintree in Mr. Beaumont's pony and four-wheel, and I had no alternative

but to comply, even had my inclination been opposed to it, which most decidedly it wasn't. We had a tolerably pleasant ride there and back, hearing some thunder coming on whilst there; also some rain both going and returning, but we didn't reach home until nearly four, from which time until dinner I wrote some notes on natural philosophy and botany. After a good dinner I felt little inclined for any hard work, and so did first the surgery dispensing and then a scene and a half of a play of Scribe's, and then copied out a little of the 'Ancient Mariner', and then Alfred Gardner came and I had to go and have a game of chess with him, when, to recompense me for going without my tea, he gave me some moselle; and having drunk about half a dozen glasses over a cigarette I admit I could not do anything when I came home, and finished by smoking a pipe and drinking gin-and-water with Manthorpe here; which left me in a state not fit for writing my journal, or for anything."

Chess and the study of botany appear to have been his main recreations and social affairs do not seem to have had any attraction for him. All this time his talent for drawing was developing. Gowers in later life looked back with pride and some affection to these years of apprenticeship. Again and again he referred to the value of that particular method of training which already was dying out in the medical profession. Certainly Gowers wasted scarcely an hour of that two-year period, though his diary does not hold many references to actual clinical matters.

But among the sick villagers amidst whom he worked was a family which may well have fired his imagination and directed his interests towards the obscurities of the nervous system. Four boys, out of a family of ten, who lived close to Derwent House, were afflicted with a strange disorder of locomotion, with wasting of some muscles and



Derwent House, Coggeshall, as it appears to-day (1947). Here Dr. Simpson lived in 1860.

enlargement of others. In addition all the affected children had hypertrophied tongues. This curious malady certainly impressed itself upon his memory and we shall find later how he made good use of this item of clinical experience.

On September 30, 1863, Gowers left Coggeshall for good, went into lodgings with his mother in Roxburgh Grove, London, and entered University College Hospital as a medical student.

Only fragments of his student life come down to us. His studies no doubt precluded the upkeep of a diary, for after a two-year gap there is a concluding entry: "March 20, 1865. I am busy working for the examination in physiology and histology and devote my whole time to it. I rose this morning at about half past six and studied until 9.30, with some intermission for breakfast. I then went down to college and heard Dr. Sharp lecture 10-11, worked in the library until 12.30 and returned home to dinner, after which, instead of going for a good walk as I had promised myself on this, as clear a day as ever I remember the 20th March to be, but with as high a wind and as much dust as to make the streets very unpleasant—instead of this walk I had to go down to college for an extra lecture from Dr. Sharp on muscular electricity. Returned to tea and read a little of General Foster's Life. After tea attempted to study and a little microscopic work . . . I must leave off now. . . . May God in His infinite mercy complete the work in me which I trust He has begun."

Among the students in the same batch were two young men who were destined for distinction, namely Thomas Barlow (afterwards Physician to Queen Victoria and to King Edward VII) and W. S. Greenfield, later Professor of Pathology at Edinburgh. Others who studied about the same time were Rickman Godlee and Sidney Copeland.

Leander Starr Jameson was also a fellow-student, but several years his junior.

Gowers' copy of Tyler Smith's text-book of Midwifery rests at present on the shelves of the National Hospital Library. It is interleaved with blank pages, upon many of which Gowers had written notes and memoranda in his exquisite script (see Plate 3). Such studious industry was doubtless as rare in his generation as it must be to-day.

After qualifying in 1867, taking his M.R.C.S., he worked as assistant and secretary to one of his most distinguished chiefs, Sir William Jenner, Bart., Court doctor, President of the Royal College of Physicians, and the autocrat and despot of the medical profession. Such an appointment is evidence of Gowers' merits as a student. It was important in bringing this newly qualified doctor into intimate contact with the activities of one of the most able medical men and at the same time the head of the profession. This association, it might be thought, would prove ill-fated, for both were men of strong and rigid personalities. But it turned out to be successful and harmonious, and in later years Gowers always referred with respect and affection to his old chief Jenner. In his own words . . . "the daily intercourse with that intellect was a privilege inestimable." Another outstanding figure at University College who influenced Gowers' future was Sir Russell Reynolds. Already known for his interest in nervous disorders, he had been one of a small body of physicians who a year or two previously had founded the National Hospital for the Paralysed and Epileptic in Queen Square, Bloomsbury. No doubt Russell Reynolds' teaching directed the attention of young Gowers still more closely into the direction of neurology. And with Charlton Bastian already on the junior staff, and Edward Sieveking in the offing, there was a certain bias at University College towards the study of neurology.

From 1865 to 1870 we find Gowers living in rooms at 32 Mornington Crescent and working between University College Hospital nearby, and Jenner's consulting rooms at 63 Brook Street. 'Gowers' active brain was restless. He was studying for higher qualifications. Shorthand, etching, natural history and chess were for his lighter moments. But he had not altogether finished his academic pilgrimage. The M.B. (Lond.) was taken with first class honours in 1869, after he had already secured the Gold Medals for Botany, Physiology, Anatomy and Materia Medica, and the Silver Medals for Pathological Anatomy and Practical Physiology and Histology. The M.D. with Gold Medal was achieved the following year.

1870. *ÆT.* 25

In this same year, 1870, Gowers applied for and obtained the newly-made appointment of Medical Registrar to the National Hospital for the Paralysed and Epileptic.

This remarkable institution had been opened just ten years before at No. 24 Queen Square, Bloomsbury. With the two original physicians, J. S. Ramskill and C. E. Brown-Séquard, others had become associated, such as Sir William Ferguson, J. Hughlings Jackson, C. B. Radcliffe, Sir J. Russell Reynolds, E. H. Sieveking, Thomas Buzzard and H. Charlton Bastian. The hospital had grown to 36 beds by 1865 and three years after that it could accommodate 64 patients. This nucleus of brilliant physicians was destined to be world famous. Reynolds was later to be President of the Royal College

of Physicians ; while Hughlings Jackson came to occupy a place in neurology which was unique.

Gowers now found himself among a lush variety of obscure and intriguing clinical problems, working in the closest association with some of the greatest intellects in British medicine. The environment must have been exhilarating, and surely stimulated all of Gowers' industry, carefulness and brilliance. Two years after crossing the threshold of the National Hospital, Gowers successfully applied for the appointment of Honorary Assistant Physician to the Hospital. Other achievements followed quite soon. At his parent hospital he was made Assistant Physician, and Assistant to the Professor of Medicine. The Fellowship of the Royal College of Physicians was accorded him in 1879.

During these busy years Gowers did not allow work to monopolize his interests. He met an attractive and intelligent kinswoman of his colleague Russell Reynolds, a Miss Baines. She was the daughter of an important Yorkshire business man, the proprietor, with his brothers, of the *Leeds Mercury*. The young couple were attracted to each other and soon their friendship deepened. In 1875 they married and set up house in No. 50 Queen Anne Street. There Gowers remained and practised until his eventual retirement.

Although it is difficult to imagine how this young neurologist was able to find opportunities for writing, nevertheless in the late seventies, readers of the *Lancet* and *British Medical Journal* began to notice from time to time vivid and arresting articles dealing with various topics, mainly neurological but at times cardiological. Certain literary chares fell to him, as to many other youngsters of promise. He was invited to edit the section on the Central Nervous System for the Eighth Edition of Quain's "Anatomy". This was in 1876. He undertook, and

PLATE IV



32 Mornington Crescent, London, N. in 1946.

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what is more, completed, a translation of Pagenstecher's and Genth's "Atlas der pathologischen Anatomie des Augapfels" (1875). He contributed articles upon the Blood to Reynold's "System of Medicine" in 1877 and 1879.

Between the years 1871 and 1879 his health was none too good, his researches and professional duties being interrupted by attacks of abdominal pain. In retrospect we would doubtless make the diagnosis of a grumbling appendix. Characteristically Gowers studied his own symptoms and signs with interested detachment, and when at the turn of the century the condition of "perityphlitis" was beginning to arouse attention, Gowers did not remain indifferent. The operation upon King Edward VII was followed by a spate of letters in the medical press on the nature and pathology of this novel disease. Gowers contributed to this discussion in a personal vein . . . "Between 26 and 34 I had five or six definite attacks of perityphlitis, the last of great severity. In none was there any spot of greater tenderness to suggest that the affection started in the appendix. My personal observation generated a strong conviction of the origin of the form from which I suffered. In his teaching Sir William Jenner used to insist on the variation in the amount of peritoneum over the cæcum in connection with intussusception, which he held to occur chiefly when the covering is so complete as to give rise to a mesocæcum and consequent mobility. It seemed to me that true perityphlitis occurs especially when the cæcum is imperfectly surrounded by peritoneum so that part of the intestinal coat is in direct relation to the extraperitoneal connective tissue and that, in this, cellulitis is excited by the spread of inflammation from the mucous membrane of the bowel. Certainly every attack was distinctly set up by intestinal catarrh. Besides the definite attacks with some induration, the cæcum seemed

to become prone to be slightly inflamed, for I had many attacks in which the cæcum became distended and very tender. The state passed with a day's rest, hot fomentations and the avoidance of any action of the bowels. The last attack was very instructive. Beginning in the usual way, the cellulitis which I assume was excited from the mucous membrane, spreading clearly in the extra-peritoneal tissue, and the induration that resulted extended as far as the middle line of the abdomen. I suppose that there was no indication of suppuration, for Sir William Jenner, who kindly looked after me, did not think a surgeon's opinion necessary. In the course of a few weeks the whole gradually disappeared, in spite of an incidental attack of catarrhal jaundice. It was before the days of "appendicitis". I wonder whether, with such extensive induration, I should have escaped operation and the removal of the appendix at the present day. I do not think my prospects of recovery would have been increased thereby. I have met with several illustrations of one other fact which my experience illustrated—that a very severe attack of peritonitis, whether operated upon or not, is usually the last. I think the explanation is that the connective tissue is left in an altered cicatricial condition which becomes less and less prone to inflammation as the cicatricial change is more and more complete."

We should endeavour to visualize how the diagnosis of nervous disease stood a century ago. When Hughlings Jackson was a medical student, neurological practice was largely made up of epileptics, hysterics and paraplegics. The last group was a heterogenous one, from which some sort of classification was beginning to shape. With the first descriptions of paralysis agitans in 1817, of disseminated sclerosis in 1837 and of locomotor ataxy in 1847, clearer ideas were possible. Year by year, and in rapid succession, the secrets of the nervous system were yielding

to the clinico-pathological researches of the 19th-century physicians. William Gowers found himself in the throes of great activity along these lines, and, joining the band of pioneers, soon became conspicuous among them. Progress was rapid, but patchy. It is interesting to turn to the early case-records of the patients admitted to Queen Square, or to peruse the earlier text-book accounts of cerebrospinal disease. We find the emphasis falling upon diagnoses which are now less commonly made, while certain disorders familiar to-day are infrequently recorded. Among the diagnoses which appeared often were angular curvature of the spine, hystero-epilepsy and myelitis. Disseminated sclerosis was seldom recognized during the 19th century, though it had been featured by Carswell and noted by Cruveilhier in 1837, and was later more fully described by Frerichs, Rindfleisch, Vulpian and by Charcot. Some cases must surely have been missed, and Gowers himself was no doubt at times an offender. But it is arguable that the incidence of this disease may well have increased in modern times. Diffuse cerebral arteriosclerosis was another condition rarely discerned when Gowers joined the National Hospital. Hæmorrhage, and acute softenings of the brain were, of course, clearly visualized, but the manifold symptoms of the hypertensive and of the arteriopath were inadequately described under the conceptions of anæmia and hyperæmia of the brain. Doubtless the lack of instrumental evidence as to the state of the blood pressure was responsible, and clear-cut ideas upon hyperpiesia did not develop until years later.

1872-1877. *ÆT.* 27-32

One of Gowers' first appearances in print was characteristic of a particular aptitude or interest of his, namely

his inventive skill. In January 1872, he wrote a note on a safety hypodermic syringe, which rendered careless overdosage virtually impossible. A stop was placed upon the piston-rod within the barrel so that it could not be drawn up beyond a determined point. Gowers induced Messrs. Hawksley to put the instrument upon the market, but there is no evidence that it ever attained popularity.

Gowers' earliest papers are not well known to-day, for they did not break new ground. He was feeling his way, as it were, through the labyrinth of nervous disorders. The manifold syndromes of spinal and cerebral disease lay around, but few at that time had clear ideas as to the morbid anatomy of many of the clinical pictures. Even the normal morphology of the nervous system was imperfectly recognized, while neurophysiology was a *terra incognita*. In these first few papers Gowers showed himself still *in statu pupillari* and in the process of clarifying his ideas by putting them on paper.

In 1874 he published some clinical notes on facial paralysis. The following year he wrote on a case of convulsion from brain injury, or traumatic epilepsy as it would be termed nowadays. This paper contained observations upon the involvement of the minor side in epileptic seizures which were predominantly unilateral; these remarks were of great value to Hughlings Jackson who quoted them in his study of the after-effects of epileptic discharges and elsewhere. A case of simultaneous embolism of the central retinal and middle cerebral arteries was also recorded. The year 1877 saw papers on the arteries in Bright's disease; the diagnosis and treatment of auditory vertigo; visceral syphilis; the pathology of canine chorea. The material within the first of these was quoted by Jackson in the annual oration to the Medical Society of London. "Dr. Gowers", he said, "is so good an ophthalmoscopist, and, above all,

PLATE V



William Gowers at the age of twenty-nine years. One of the few pictures which exist showing him without a beard.

knows so thoroughly well the varied healthy appearances of the normal fundus oculi, that I should accept these minute observations of his as being as precise and as exact as it is possible for such difficult observations to be." He also described two case-reports of what he called "saltatoric spasm" and referred to early and similar cases observed by Bamberger, by Guttmann and by Frey. The clinical picture was that of severe clonic spasms of the legs and back coming on while the patients were erect, and associated with some reduction in motor power. To-day the case records have a very hysterical colouring.

Young Gowers played an interesting though minor role in collaboration with his senior colleague, Hughlings Jackson. He carried out pathological examinations of a number of fatal instances of brain tumour, and among them was the case of Eliza Joad who died of a large glioma of the hinder part of the right temporosphenoidal lobe, with other smaller growths near and in the right hippocampus major. This patient during life had shown a peculiar mental confusion with an inability to recognize persons, objects and places. Jackson called this symptom "imperception" . . . "a defect as special as aphasia" . . . and herein we find the first recorded instance of what Finkelnburg later termed "asymboly" and what—following Freud—we now speak of as "agnosia".

This same year, after working in Professor Burdon Sanderson's laboratory at University College, Gowers secured for himself a considerable degree of fame for he got Hawksleys to devise a modification of Hayem's hæmatometer, or instrument for counting red cells in the blood. The innovation consisted in placing the 0.1 mm. squares not on the eyepiece, but upon the glass-slide at the bottom of the cell. Thus was born the Gowers' hæmocytometer, though the author did not himself use that term until a year later. Forty years later he was still interested

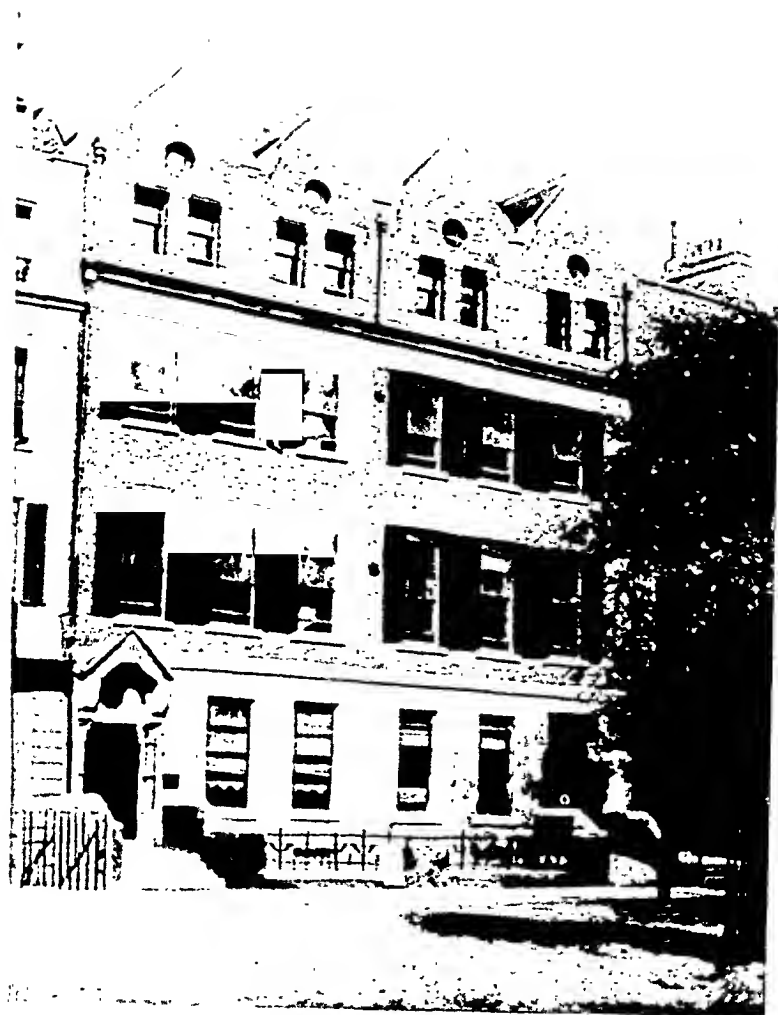
in this technique and he made, in 1906, some additional graduations within the hæmocytometer to facilitate the counting of the cells.

On December 13, 1878, the Clinical Society of London met, and William Gowers exhibited yet another apparatus, which had also been constructed for him by Hawksley, for estimating the amount of hæmoglobin in the blood. He claimed that this new method was simpler, more exact and more convenient than the older instruments. The colorimetry was carried out against a standardized solution of carmine and picrocarmine. A simple note in the *Lancet* describing these proceedings was the modest début of the famed Gowers' hæmoglobinometer, which remained for over twenty years the standard technique in hæmatology, until modified later by Haldane's instruments.

1878-1879. *ÆT.* 33-34

In 1878 papers appeared on the history of leucocythæmia and on a peculiar form of albuminuria. There were also articles dealing with chorea. Three papers date from the year 1879, and dealt with the tendon reflex phenomenon; syphilitic neuroses; and movements of the eyelids. In the first of these he gave a description of the nature and significance of the patellar reflex and ankle clonus. For the first time graphic methods were used for studying the subject and by timing the latent interval, Gowers was able to identify the former phenomenon as a true spinal reflex. The third paper is an example of close clinical observation of the movements of the upper and lower eyelids. Gowers believed that in addition to the orbiculares oculorum and the levator palpebrae superioris, the globe of the eyes also assisted in moving the lids.

PLATE VI



The National Hospital, Queen Square, in 1866.

[Facing p. 26]

Thus in vertical nystagmus of the eyeballs the eyelids participated. He believed that the centre for forceful closure of the eyes was physiologically distinct from that subserving gentle closure. This same brief communication also drew attention for the first time to a retraction of the upper lid on downward movement of the eyeball after incomplete recovery of a third nerve palsy. This little point has been described at various times as Fuchs' sign, the Köppen sign, or Brixa-Köppen's sign, or the pseudo-Græfe sign, but in his 1946 monograph, Wartenberg has rightly assigned priority to Gowers.

This year was important in that Gowers was not only elected to the Fellowship of the Royal College of Physicians, but, as the youngest recruit, was invited to deliver the Goulstonian Lectures the following year. The choice of subject was a happy one. Epileptics made up a considerable proportion of the patients at the National Hospital and afforded Gowers abundant material for clinical study. His senior colleague, Hughlings Jackson, was also deeply interested in the disease but the more recondite problems of the pathophysiology appealed specially to him. Gowers' concern was with the bricks and mortar of the subject, and he set out patiently to observe phenomena and to collect facts, rather than to weave speculative webs. The Goulstonian Lectures upon Epilepsy were accordingly delivered in 1880 and were published *in extenso* both in the *British Medical Journal* and the *Lancet*. A series of 1,450 personally observed cases formed the basis of this study. Two years later Gowers revised the lectures and published them in book form. Fuller notice will be given later.

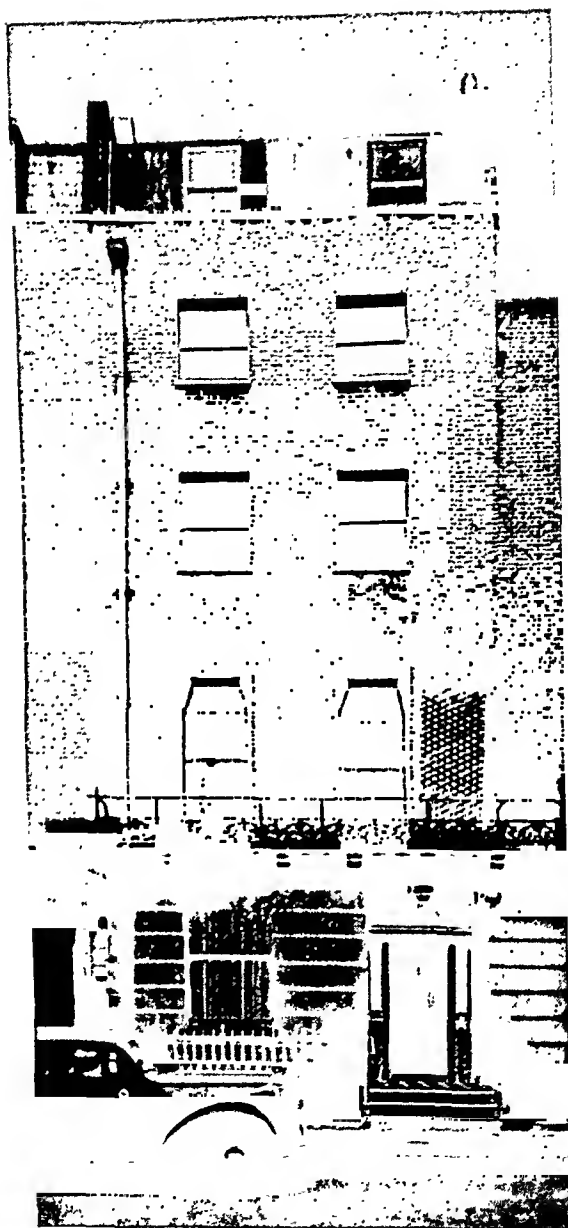
In April 1878 appeared the first issue of *Brain*, that unique periodical of neurology, under the combined editorship of J. C. Bucknill, J. Crichton-Browne, David Ferrier and J. Hughlings Jackson. A number of

physicians were invited to contribute papers, among them Gowers, whose article on "Some Symptoms of Organic Brain Disease" is to be found in the first number. Under this rather nondescript title Gowers drew attention to two interesting but unrelated clinical points. He first discussed the occurrence of sudden paralysis in cases of cerebral tumour, and he enumerated the circumstances in which this might occur as follows: (1) associated conditions: (a) hæmorrhage into and around the growth, and (b) softening from either coexisting vascular disease or pressure on or invasion of blood vessels; and (2) direct effects, (a) inhibition (?) and (b) exhaustion from convulsion. Illustrative cases were recorded. In the second part of this paper Gowers described a symptom which might follow disease of the central part of the optic thalamus, namely a spasmodic slow inco-ordination. The affected hand when extended was unsteady and there was considerable irregularity in the motility of the fingers, causing them to "sprawl" about. There was also some slow involuntary movement of the fingers. It is interesting, in light of the subsequent work of Roussy and of Head and Holmes in delimiting a thalamic syndrome, that Gowers' patient suffered much spontaneous pain in the arm and hand.

Within this same first volume of *Brain*, Gowers published a paper he had read to the Royal Medical and Chirurgical Society describing the brain of a man aged 40 who had been born without a left hand. The chief anomaly consisted in a conspicuous narrowing of the mid-part of the ascending parietal convolutions on the left side. This observation was of great topical interest, for at that time Ferrier had been demarcating the excitable area of the cortex in monkeys. The region of cortical atrophy corresponded well with Ferrier's hand area.

Under the term "reflex inertia" of the eyeballs, Gowers

PLATE VII



50 Queen Anne Street, London, W.1 in 1946.

[Facing p. 28

described in 1875, apparently for the first time, that interesting phenomenon which has since been spoken of as the French doll phenomenon, fixation spasm, or supranuclear ophthalmoplegia. Gowers' patient was an advanced case of amyotrophic lateral sclerosis. Voluntary deviation of the eyes, to command, was carried out slowly, and after an appreciable delay. But the head had already turned promptly in the correct direction leaving the eyes fixating still on the original subject. The movement was independent of, and even opposed to, the patient's volition. Gowers saw in this clinical phenomenon, the proof of a reflex mechanism maintaining fixation of the eyeballs, and capable of doing so during movements of the head. A dissociation between volitional and reflex movements of the eyes was evidently at work here.

The year 1879 proved a sort of *annus mirabilis* for Gowers for as an earnest of his industry, four important works in all were either written or published in addition to these shorter papers. First we have the lectures on Epilepsy; next a monograph on Pseudohypertrophic Paralysis; thirdly, his address on the Diagnosis of Diseases of the Spinal Cord, and fourthly, his "Manual of Medical Ophthalmoscopy". Four masterpieces thus saw the light, each of which was the product of detailed and careful research, and all of them broke new ground. The last three may be examined somewhat closely.

Gowers' technique in medical writing and research was beginning to be identifiable. He differed from some of his contemporaries—Jackson and Bastian, for instance—and from others who were to be his colleagues a little later—Ferrier, Horsley, Risien Russell, Semon—in that he did not indulge in philosophical conjecture nor compile data from the published work of others. Moreover, like Charcot, he might have inscribed over his door "Vous ne trouverez pas une clinique des chiens chez moi" for he

did not employ the methods of experimental investigation. Although he doubtless read much and used references as required, he relied almost entirely upon his own clinical or clinico-anatomical experiences. Gowers brought to the bedside all his skill as a natural historian. To him the neurological sick were like the flora of a tropical jungle, and his keen eye and collector's flair enabled him to identify, arrange and classify. He learned to recognize the divers modifications of the banal or everyday material, while he quickly detected the rarities. Furthermore, he was able to pick out a species which had not previously been described or labelled. To his botanist's bent he added the virtues of diligence and orderliness, probably to an obsessional degree. He made careful shorthand notes of all his cases, and filed special lists of the unusual or the bizarre. His talent as an artist was enlisted to draw pencil sketches of the typical or the uncommon within his clinic—a stance, posture, a facial appearance, a deformed hand or foot. This ritual was taken into the dissecting room and into the histological laboratory.

Combined with these special aptitudes was a literary style which was distinguished as well as simple, arresting and clear. Gowers obviously took pains, as well as pride, in writing, and a scrutiny of his manuscripts reveals the numerous erasures and corrections in the search for the best means of expression. Pomposities of the Victorian age were not entirely foreign to his writings but they were less florid and less frequent than with many of his contemporaries. The reader is never for a moment uncertain as to the meaning of anything Gowers wrote. His dislike of slipshod writing and his respect for etymological purity is shown by his correspondence with Clifford Allbutt on the misuse of "prodromata" as a plural noun (1906). Although he pleaded guilty to having used this term unthinkingly, he suggested that the Greek word *Prodrome*

should be rendered as *prodroma* in the singular and *prodromas* in the plural, and that the adjectival form *prodromal* might be adopted. He mentioned that the words *aura* and *auras* were in current and correct usage. Allbutt gave a qualified agreement in a characteristic reply. On yet another occasion he debated the appropriate adjectival form of Faraday's name. Originally he favoured "faradaic"; later he changed to "faradic"—a term which has since come into common use. It is characteristic that before adhering to this choice he first of all sought the advice of that great grammarian Professor Skeat. Gowers, many years later, gave a hint in a friendly note to one of his House Physicians, on how success in medical writing is achieved. 'In general it is a mistake to publish single cases. Far better to work up single points or publish a special case after working up its points comparatively. Nothing pays except that which gives some new suggestion. The great thing is to create a feeling in the reader—I must note anything else, this man says. . . .'

The formula of Gowers' contributions to neurology may therefore be described as the recognition of a number of salient, novel and important clinico-pathological features culled from his experience. These would be worked up and elaborated, and perhaps other cognate observations from the literature would be incorporated. In this way a short paper, or maybe a clinical lecture would take shape. This would then be published in one of the medical periodicals. Later the subject would be re-examined; modifications would be made, and new data added. Then the contribution would appear in book form, his publishers always being the firm of Churchill, and perhaps run to two or more editions. In this way Gowers secured a very wide audience.

This technique is well illustrated in his study of pseudo-

hypertrophic paralysis. As already mentioned, the young apprentice had encountered at Coggeshall a family with this strange malady. When he walked the wards in London he learned that the disease had been described in 1852 by Dr. Meryon, though confusing the malady with progressive muscular atrophy. Others, like Oppenheim in 1855, had made the same error, but in 1861 Duchenne of Boulogne wrote the first adequate account of this affection, cases of which had come to his notice some three years before.

At the National Hospital such cases came to his own clinic ; Clifford Allbutt brought two more to his attention ; his orthopædic colleague, William Adams, gave him the opportunity of examining 18 others. One of his patients succumbed, and with the help of Dr. Lockhart Clarke, Gowers was able to study the morbid anatomy. The young Registrars at Queen Square—Newman, Sankey, Sturge and Broster—all afforded him assistance so that Gowers was in a position to deliver a lecture on this little-known affliction to the University College students visiting the National Hospital. This lecture appeared in the *Lancet* in July and later in the year Messrs. Churchill brought it out as a little book.

Gowers' opening words, in which he defined the natural history of the condition, are a model of impressive simplicity. He wrote, "The disease is one of the most interesting and at the same time most sad, of all those with which we have to deal : interesting on account of its peculiar features and mysterious nature ; sad on account of our powerlessness to influence its course, except in a very slight degree, and on account of the conditions in which it occurs. It is a disease of early life and of early growth. Manifesting itself commonly at the transition from infancy to childhood, it develops with the child's development, grows with his growth—so that every

increase in stature means an increase in weakness, and each year takes him a step further on the road to a helpless infirmity, and in most cases to an early and inevitable death.'

All the characteristic clinical features which to-day are a commonplace were described with precision and originality. He drew particular attention to the atrophy of the latissimus dorsi and of the sternal part of the pectorals, and anticipating the concepts later made by his pupil, Edwin Bramwell, went on to point out that these particular muscles were the lowest of all the limb muscles in physiological importance. His keen botanist's eye detected one or two unusual manifestations, standing out like four-leaved shamrocks. He noticed that some patients displayed a hypertrophy of the temporals and masseters; others a macroglossia; others an enlargement of the heart. These observations of his remained unnoticed for decades. General adiposity was seen to be a common sequel in later life, when difficulty in urination might also develop. Some aspects of social medicine did not escape him. Muscular dystrophy was in his experience independent of environmental conditions, and, indeed, seemed to be less common in the families of the poor than of those in comfortable circumstances. The age at which death commonly occurred, and the cause of exitus, were not overlooked by Gowers. The diagnostic value of a biopsy of a piece of diseased muscle was mentioned and Gowers referred to Duchenne's "histological harpoon" in this connection. Like Gordon Holmes many years later, Gowers examined the spinal cord and, despite a certain incipient disintegration in the grey network of the lateral columns, especially in the lower dorsal region, concluded the pseudohypertrophic muscular paralysis was not a disease of the spinal cord. His summing up of the nature of the disease was to regard it as a perverted

tendency of development inherent in the germinal tissue of the muscular system.

An interest in myopathic disease persisted throughout his career, and twenty-three years later he described a "distal type" with involvement of the extremities in an unusual distribution. To-day the case-records read suspiciously like examples of dystrophia myotonica. Gowers also narrated that in the Board Room of the National Hospital there hung an engraving of Raphael's Transfiguration. He had been in the habit of demonstrating one of the figures there—a victim of demoniacal possession—as an example of an epileptic seizure. But Duchenne, on a visit to the hospital in 1827, suggested to Gowers that the child angels depicted by the artist could easily be cited as instances of pseudohypertrophic muscular dystrophy.

The "Manual and Atlas of Medical Ophthalmoscopy" appeared in this same year, eight years after Allbutt's monograph on the same subject. Like his senior colleague, Hughlings Jackson, Gowers was quick to realize the value of the ophthalmoscope in diagnosis. He used it constantly and learned much from what it revealed. His experiences, collated in a balanced fashion with the literature, made up the subject-matter of his valuable book. A special feature was found in the illustrations, line drawings, holotype and coloured plates, all of which were his own work. There was a long discussion on the pathogenesis of optic neuritis, and, like Jackson, he disagreed with the idea that it was due to the mechanical effect of raised intracranial pressure. Allbutt's term "choked disc" he strongly deprecated. One also finds an interesting section on the ophthalmoscopic signs of death. Instructions upon "how to sketch the fundus oculi" were relegated to an appendix. As a reviewer wrote in the *British Medical Journal*, this treatise accorded

Gowers an European reputation. "Dr. Gowers has the advantage of being armed at all points for an investigation of this kind, being, as this book abundantly proves, at once a highly informed physician, laboriously instructed by his own bedside investigations, and well informed by the progress of contemporary medical literature abroad. He is at the same time skilled in instruments of exact observation, a good histologist, and an artist of no small power."

"The Manual and Atlas" was very well received and became so popular that a second edition appeared in 1882; a third in 1890 and a fourth in 1904. In these last two he was assisted by Marcus Gunn, the ophthalmic surgeon on the staff of the National Hospital. The authors replaced the coloured plates by monochrome illustrations in the fourth edition, as enhancing the detail more satisfactorily.

In October of this same year, 1879, Gowers addressed the Medical Society of Wolverhampton, taking as his subject the diagnosis of diseases of the spinal cord. The lecture appeared in the *Medical Times and Gazette* for November and December. The following year Churchill issued the lectures, expanded and extra-illustrated, in the form of a little monograph. This work is one of unusual interest, for in it are several features which were novel, but which became established as part of the ordinary doctrines of neurology.

In the first place there appeared an illustration, which is now universally utilized, showing the relations of the spinous processes, the vertebral bodies and the segments of the spinal cord. Gowers himself drew the original picture from dissections which had been prepared for him at University College Hospital by a young demonstrator of anatomy named Victor Horsley.

Secondly, the author referred almost casually to the presence of degeneration which he had found in the

anterolateral region of the cord above a crush injury. This is the first and quite modest mention of the direct cerebellar column which to-day bears the name of Gowers' tract. Indeed, we owe this particular term to the perspicacity of Bechterew who detected this original observation in the monograph. Oddly enough Gowers in this very lecture expressed himself as critical of the use in neuroanatomy of eponymous terms, such as the columns of Türck, Goll, Burdach, etc. "There are very few observations in medicine", he wrote, "regarding which it is not obvious that they would speedily have been made by someone other than the actual observer; that it is very much of an accident that they were made by certain individuals. Scientific nomenclature should be itself scientific, not founded upon accidents. However anxious we may be to honour individuals, we have no right to do so at the expense of the convenience of all future generations of learners." Gowers surmised that this fibre-tract might transmit some quality of sensation, though whether from the skin or from the deeper structures he could not hazard.

The third feature of interest which these lectures hold is the advent of the expression "knee jerk" into the literature. Hitherto this clinical test had been referred to in a variety of ways, *e.g.*, the patellar reflex, the Westphal phenomenon, and so on. It is strange that such an essential tool in neurological nomenclature as the term knee jerk should have made its debut in so unostentatious a fashion. Gowers also described a method of enhancing a sluggish knee jerk, by slipping a hand under the knee and resting it on the opposite thigh. He referred to a stout and worried colleague who had been unable to evoke a reflex on himself, but whose fears of a threatening locomotor ataxia were dissipated when Gowers demonstrated a reflex by the technique described.

Hitherto reflexes had usually been elicited by tapping with the inner border of the hand, but Gowers pointed out the value of a rubber-edged stethoscope for this purpose, as well as of a "percussion hammer" such as Messrs. Coxeter had constructed for the purpose of percussing the chest.

A fourth feature of this monograph is the introduction of the word "myotatic", from the Greek *Tatikos*, extended. He disliked "tendon reflex" as a term because the response depended upon a muscle reflex irritability, or more accurately, a "myotatic irritability". Many years later Gowers confessed that he had been responsible for the introduction of two new expressions into the language of neurology, namely knee jerk and myotatic. Actually this is a modest understatement of his terminological accomplishments.

Physiologists—whose major vice has never been an undue modesty—had previously made themselves rather ridiculous over the question of the sensitivity or otherwise of the human tendo achillis. By failing to detect nerve-endings in that structure, some histologists had concluded that the tendon was insensitive. Later, one of their number eventually discovered nerve-elements and conceded that the tendon, after all, could be sensitive. Gowers' dry comment was that it did not require a microscope to demonstrate this, as anyone might have ascertained who was willing to take the trouble to give his tendo achillis a sharp pinch.

This important, if not historical, address appeared in a second and enlarged edition in 1881, while a third edition came on the market in 1883.

1880-1881. ÆT. 35-36

The next great milestone in the Gowers bibliography was the appearance in print in 1881 of his Goulstonian Lectures on "Epilepsy and other Chronic Convulsive Disorders, their Causes, Symptoms and Treatment". Based upon 1,450 personally observed cases, the lectures were augmented in order to constitute this monograph. It forms a considerable landmark in the literature of epilepsy, and stands out prominently among a number of other works which happened to appear about the same time. Even after the book was published Gowers did not lose interest in this subject but continued to collect and tabulate his cases. The result was the much enlarged second edition which was issued in 1901 and now comprised a series of 3,000 personal cases. In the preparation of this second edition he was assisted by James Collier and Victor Horsley.

Gowers' "Epilepsy" has remained a classic right up to the present time. The introduction of luminal in about 1914 and of diphenyl hydantoinate in 1936, are practically the only great therapeutic advances in the subject since his time; while pathophysiology remained but little advanced until the application of electroencephalography just before the last war. For any purely clinical consideration of the subject Gowers' monograph was, and still is, unsurpassed, and it is a grim irony that so many modern neuropsychiatrists hasten into print upon some aspect of the disease, without preliminary reference to the writings of Gowers.

It will be more convenient to study Gowers' views on epilepsy from the material gathered into the second edition. To-day the book is largely neglected and quite undeservedly so, for Gowers' acquaintance with the kalædoscopic symptomatology of epilepsy was unsur-

passed. His knowledge of the more unusual manifestations of epilepsy, as well, of course, as of the commonplace, should be utilized by all who embark upon what they imagine to be a description of something new.

A number of examples may be taken. Gowers was, of course, conversant with all the points of distinction between epilepsy and psychogenic episodes ; but he was well aware of the common ground between these two conditions. He believed that some attacks stood midway between hysteria and epilepsy. Others were so indeterminate as to defy a dogmatic differentiation. Both had to be distinguished from simulation. He referred to an occasion when he and Sir Russell Reynolds were walking in the street and a man in front of them suddenly fell in an attack of some sort. Neither could say whether it was genuine or feigned. Gowers added that the latter was probable, " though the choice of spectators may have been unintentional ".

As regards the course of the affection Gowers pointed out that a spontaneous cessation of attacks came about more often than was commonly admitted, though not sufficiently so to be reckoned as a practical element in prognosis. He had noticed that the fit-incidence in a chronic epileptic was often reduced during the course of any intercurrent acute illness, with the exception of scarlet fever.

Discussing the circumstances under which an attack might develop—the favourable and the unfavourable factors, and the occasional provocative stimuli—Gowers referred to cases where a fit might follow the act of micturition ; or conversely where urination might stave off an impending attack. Still more interesting was his description of a case where music always provoked a fit, and another where a certain organ note would induce an attack of epilepsy. These comments anticipate by many

years the description of what we would now call musico-genic epilepsy and acoustico-motor epilepsy respectively.

Convulsive laughter in association with an attack of petit mal is a rare and interesting phenomena which has in 1946 been the subject of a detailed monograph by Rubiček. It is disappointing to find that the author has missed the fact that Gowers described this association clearly in these lectures. He also referred to paroxysmal sneezing ; and to the analogies of migraine with epilepsy, a concept which he was to expand some years later.

Although to-day the treatment of epilepsy is a more straightforward and perhaps a more satisfactory matter than it was in Gowers' time, his remarks on therapy are interesting and not unprofitable to read. Like his contemporaries, Gowers relied chiefly on the bromides, the use of which in epilepsy had dated from Lacock's paper in 1854. He mentioned that at the National Hospital almost two tons of potassium bromide were dispensed in the course of the year. Nowadays, of course, the drug has fallen into disrepute, especially in the treatment of epileptics.

Gowers also used borax on occasions, and he was himself responsible for the introduction of this drug for epileptics, mentioning it first in his Goulstonian Lectures. He prescribed it in inveterate cases in which bromide was without effect. In the second edition, written over twenty years later, Gowers adhered to his opinion as to the "considerable relief" it sometimes afforded, and he quoted in support a paper written by Risien Russell and James Taylor in 1890. For the chronic headaches to which certain epileptics were prone, Gowers recommended either *cannabis indica* or nitroglycerine. The latter was a favourite remedy of his in other types of headache and it formed a constituent of what is often described as "Gowers' mixture" for the treatment of migraine. The

use of iron in epileptics was discussed. Many authorities, including Hughlings Jackson and Brown-Séquard, believed that this drug was harmful, but Gowers considered otherwise. In a special paper written in 1878 devoted to this subject, Gowers stated that the effect of iron on epileptics was not always the same and that at times it proved beneficial. More particularly he found that in some cases, probably a minority, iron seemed to increase the severity and frequency of the fits. In a large number of cases iron could be given without any noticeable effect on the fit-incidence. Where the influence of the iron proved unfavourable the increase in the fits often did not occur until the iron had been continued for some weeks, and after an initial stage of betterment. Lastly, in some cases the benefit was permanent not transient. Indeed, some cases of epilepsy were cured by this means alone " . . . as far as the affection can be said ever to be cured by drugs ". As to the more precise indications for its use, Gowers found iron most useful in those anomalous forms of the disease standing midway between epilepsy and hysteria.

Finally, Gowers mentioned a device for the curtailment of a hysterical attack, namely a vigorous tug at the pubic hair. This trick, which he learned from an old country practitioner, he did not hesitate to employ at the bedside.

By 1880 Gowers had established a reputation not only in British medicine but also in international circles. His writings proclaimed his brilliance and his energy. His practice was growing. Already known to a comparatively small circle as a great lecturer, his superlative gifts as a clinical demonstrator were not yet common knowledge.

We may remind ourselves of Gowers' relationship to the outstanding figures in British, Continental and American neurology. In 1880, he was 35 years of age. At Queen Square, Jackson was 45 and Bastian 43. Horsley was as

yet a newly-qualified young man of 23. In France, Charcot was 55, Raymond 36, Pierre Marie 27, while Babinski was the same age as Horsley. Oldest of the French school was Duchenne, then in his 74th year. Closest to him among the French was Déjérine, then 31 years of age, whose career was to run on parallel lines to his own. The great figures in German neurology included Erb aged 40 years ; Friedreich 55, Westphal 47, Quincke 38, Strümpell 27, Wernicke 32, Meynert 47, while Möbius was 26 and Oppenheim only 22. In Philadelphia lived Weir Mitchell, the outstanding American neurologist, then aged 51.

1885-1889. *ÆT.* 40-44

An interesting clinical lecture on "Ataxic Paraplegia" was delivered at University College Hospital on February 23, 1886, and was published in the *Lancet*. The syndrome consisted, according to Gowers, in a gradually progressive weakness and unsteadiness of the legs. It could be seen more often in males, especially between the ages of 30 and 45. Pain was not a conspicuous feature though the patient might complain of numbness or tingling. The arms might escape, for a while at any rate. The morbid anatomy of these cases consisted in a posterolateral sclerosis, often associated with a peripheral zone of sclerosis. He mentioned that at autopsy the degeneration in the lateral columns might appear less than expected from the clinical state. He ascribed this to the fact that degeneration affected first, and chiefly, the most distal parts of the pyramidal fibres, as they arborized within the grey substance.

It is a matter of conjecture what modern nosological entity Gowers was really describing under this title "ataxic paraplegia". Probably more than one condi-

tion was gathered into this fold. Most of the cases, no doubt, we would to-day call subacute combined degeneration of the cord, for the pioneer paper of Risien Russell, Batten and Collier was not to appear for another fourteen years. But some of the cases might have been examples of disseminated sclerosis ; others spinal syphilis and others, again, spinal arteriosclerosis.

Messrs. Churchill published in 1885 a collection of "Lectures on the Diagnosis of Diseases of the Brain". This volume comprised eighteen lectures delivered to the students of University College Hospital upon neurological topics, including anatomy, physiology, diagnostic pathology and ophthalmoscopy. The subject-matter was elementary and clearly set out, and though Jackson spoke of it as a "masterly work", the present-day neurologist will not perhaps find much to interest him except from a historical point of view. Exception might be made of the chapter on affections of speech where Gowers pays a very warm tribute to Hughlings Jackson for his pioneer work. The name of Gowers is not often associated with the problem of aphasia, and he mainly followed his colleague Bastian, though he did not neglect the writings of Jackson which he much admired, and whose phraseology he adopted.

He had also been particularly impressed with the monograph "Die Aphasische Symptomen-Complex" published in 1874 by young Wernicke of Breslau and also with the pathological studies carried out in Italy by Sepelli. Gowers had views of his own concerning aphasia which are not without interest, and these are to be found both in these lectures and in the Manual. Like Jackson, he thought a great deal about the role of the right hemisphere in speech. He ascribed the gradual restitution of speech after an apoplectic aphasia to the activity of the right half of the brain taking over the lost functions : the proof of

this contention he saw in the fact that a second ictus, involving the right cerebrum, would ablate the reacquired power of speech. With regard to the morbid anatomy of dyslexia, Gowers recognized the importance of the left angular gyrus, but pointed out that this symptom might at times follow a lesion situated further forward. The explanation lay in the degree to which motor speech processes were concerned in the comprehension of visual speech symbols. In those of poor education movements of the lips seemed to him to play an essential part in reading, and in such persons an anteriorly placed lesion might be expected to cause dyslexia. Gowers was interested in the phenomenon of "recurring utterance" in aphasic patients, but whereas Jackson believed the phrase emitted represented the one which the victim was about to say at the time of the stroke (a "still-born proposition"), Gowers regarded the phrase as the last words actually spoken by the patient before he was struck down. Thus, a woman who told her cabman to drive her to "Mrs. Waters" and became aphasic shortly after, presented as her recurring utterance "Missus . . ."

Other aspects of aphasia interested him. The role of gesture as a modality of language; the ability of an aphasic to sing the words of a song; the testamentary capacity of a patient bereft of speech, were among the subjects he discussed. He noted, like Charcot, the phenomenon of writing or copying in the dyslexic and cited the case of the son of a distinguished poetess who would transcribe page after page of his mother's poems without being able to read them.

Etymological aspects intrigued him. He traced the history of the word "aphasia"—its resurrection by Trousseau in 1861 to replace both "aphemia" and "alalia". Gowers did not care for the term "dysphasia" and said that "aphasia" had become current to describe



The Honorary Medical Staff of the National Hospital Queen Square, 1887.
Back row, L. to R. Horsley, Beevor, Cumberbatch, Buzzard, Brudenell Carter, Ormerod, Adams.
Front row, L. to R. Marcus Gunn, Bastian, Jackson, Ramskill, Radcliffe, Gowers, Felix Semon, Ferrier.

all forms of defect just as "anæmia" applied to all forms of deficiency of the blood. He deprecated the tendency to coin manifold terms in the discussion of speech loss ". . . the whole subject has afforded abundant scope for word-making ; a large number of new terms have been introduced, most of which are needless, and to some extent injurious, fostering a harmful tendency to divide where it is desirable only to distinguish".

This treatise like many others of his was translated into German by Dr. J. Mommsen. A second edition appeared in London in 1887.

At the end of 1888, and at the early age of 43, Gowers surprised the medical world by resigning his Chair of Medicine and his appointment as Physician to University College Hospital. He gave as his reason the inability to perform his duties with thoroughness, and at the same time to meet the claims of his private practice. Upon this step the Editor of the *Lancet* commented, ". . . his work has been so extensive and has become so familiar to all, that he seems to have accomplished more than many men of advanced age". Gowers continued, however, to serve at the National Hospital, Queen Square.

In 1887 another neurological event occurred in which Gowers played one of the major roles. An army officer, aged 43, had developed a spastic weakness of his legs, gradually increasing in severity, coupled with very painful flexion spasms. To this picture was added some weakness of bladder control, and a little altered sensibility over the lower limbs and trunk. The patient took passage home from India and the day after his arrival, Dr. Percy Kidd, a kinsman of the patient, brought him to see Gowers. The diagnosis was made of a spinal tumour, a condition which was regarded then as a rarity, quite beyond the realm of treatment. Indeed, the diagnosis was scarcely ever ventured during life. Gowers had already expressed

Square that anyone who thinks he has stumbled upon something new or obscure should not neglect to search the Manual before claiming originality. A few instances may suffice in illustration.

Wilks is often given the credit for reporting in 1877 the first case of what Erb later called myasthenia gravis. But Wilks' case was probably one of post-diphtheritic bulbar palsy. A footnote in the Manual described a typical case encountered in 1874. (The disease was, of course, actually identified first in 1685 by Thomas Willis, that other great physician whom Gowers resembled in many respects.) Under the term tetanoid chorea we read in the Manual a striking record of what Kinnier Wilson in 1912 was to call progressive lenticular degeneration. We find a description of paramyoclonus multiplex, years before Friedreich gave it publicity. Spontaneous sub-arachnoid hæmorrhage is admirably described though the relationship with a ruptured berry aneurysm is not made clear. His "diffuse sclerosis" is almost certainly the disorder which Schilder was to describe in 1926 under the title encephalitis periaxialis diffusa.

In later life Gowers was well aware of the value of his text-book as a clinical treasure-trove, for in a letter to Barnes dated March 2, 1903, he wrote: "Remember that the only thing that makes me sigh is when men, especially old pupils, write on a subject I have gone into in the Manual and never refer to what I have said."

It is probable that even now we have not quite caught up with and identified all the clinical gems which Gowers collected. Thus he spoke of cases which were intermediate between paralysis agitans and senile tremor, a conception which we envisage only foggily as yet. He believed that patients with insular or disseminated sclerosis commonly came of neuropathic stock, and might present a family history of epilepsy or some form of chronic

paralysis. A queer syndrome was recorded and named by him "ataxic paramyotone", but it is difficult to label the case to-day with any degree of confidence.

Certain chapters in the Manual loom like peaks above a mountain range, for they are veritable classics of clinical description. Thus, in the first volume, one may select the sections on locomotor ataxy, the hereditary ataxy of Friedreich, and chronic spinal muscular atrophy. In the second volume the section on writer's cramp is a masterpiece.

Gowers' conception of the "element of the motor path" is well worth re-reading, as it foreshadowed the doctrine to be enunciated later by Sherrington of the "final common path". Gowers raised the interesting idea that the terminal arborizations of the upper motor neurone might be the seat of disorder, and that certain drugs, as then unknown, might exercise an influence there. The upper neurone possibly possessed an inhibitory control, loss of which might permit "hyperphysiological activity" of the spinal motor centres. He let slip the interesting concept that the pathology of functional, *i.e.*, hysterical paraplegia might be explained in this manner. The anterior horn cells he regarded as "muscle-centres" and adjacent to them were, he believed, small inhibitory centres. After an epileptic seizure these latter might become temporarily exhausted, and cause changes in the tendon reflexes. Hughlings Jackson was intensely interested in these hypotheses, which he accepted, and used as an explanation of the post-epileptic hemiplegias. He referred to these views of Gowers on many occasions, such as, for instance, his Lumleian Lectures on convulsive seizures (1890).

The manual had a favourable and even enthusiastic reception from the profession, as well as a ready sale. The anonymous reviewer to the *British Medical Journal*

hazarded the opinion that "no better manual on nervous diseases has been presented to the medical profession." This can be regarded scarcely as an overstatement, for sixty years later these words are still literally true. Indeed, every review recognized that a masterpiece had appeared, and Gowers could not but feel gratified and satisfied with his reception. In *Brain*, however, Dr. de Watteville ended a warm and lengthy appreciation with a few captious and not altogether justified criticisms of some of the terminology. Nothing could have piqued Gowers more. Already a stylist and a purist, he might have borne with adverse comment upon his neurological doctrines, but his prose was sacrosanct. It is probable that de Watteville's inappropriate sneers were never forgiven.

A second edition appeared in 1891 and 1893. In January, 1899, a third edition of Volume 1 was issued, which was prepared with the aid of his friend, colleague and assistant, James Taylor. No third edition ever appeared of the second volume. It is said that the sales of this last edition were adversely affected by the advent of Allbutt and Rolleston's "System of Medicine," the neurological chapters of which were written by many of his pupils. But the biographer cherishes in his library the draft papers of a third edition of Volume 2 of the Manual. The text is based upon the second edition but contains certain new matter, a number of corrections, and very many alterations. These last are mainly stylistic, and usually consist in a compression of some of the more involved sentences (see Fig. 9). In this way Gowers was adapting his prose to the newer methods of writing, which were becoming more concise and less formal than the Victorian usage. Many of the footnotes which appear in the second edition were to be excluded from the third.

Medical authors may be interested to learn that of the second edition, 1,500 copies were issued at a cost of £340

(viz., printing £275, binding £45 and advertising £20). Gowers himself received as profit a balance of just over £312 upon this edition.

One cannot refrain from comparing the Manual with other text-books of neurology, and especially those which appeared about the same time. The text-book which stands closest to Gowers' is, of course, Oppenheim's "Lehrbuch des Nervenkrankheiten". Prior to the Manual, outstanding systems of neurology were few. There were the sections on nervous disorders in Ziemssen's "Encyclopaedia", and those contained in Reynold's "System of Medicine". Otherwise there was available Hammond's "Treatise" and Wilks' collected lectures—the latter being particularly good, though they did not cover the whole field of neurology.

The manual formed a crowning achievement to Gowers' reputation, especially abroad, his earlier works having already been translated into several European languages, and hence widely read. By 1886 no British medical man was better known and appreciated in America, France and Germany. Osler, reviewing the Manual, said that the author at a comparatively early age had been placed among the highest living authorities on all matters relating to the nervous system. An American working in Germany once asked the distinguished professor of neurology to recommend the best book in German on nervous diseases. He was advised to buy a translation in German of Gowers' Manual.

1889-1890. ÆT. 45-46

The Lettsomian Lectures of the Medical Society of London were delivered by Gowers in 1889 and he chose

as his topic "Syphilis and the Nervous System". The lectures were published in the medical journals, and two translations subsequently appeared. Two years later Messrs. Churchill issued them in book form.

In reading these lectures it is important to recall the state of contemporary knowledge of the disease and the many gaps as yet unfilled. Schaudinn's discovery of the *spirochaeta pallida* was not till 1905, and Wassermann did not bring out his complement-fixation test until two years after that. Not until 1913 were spirochætes detected, by Noguchi, in the brain of a general paralytic, while Pacheco and Silva did not find spirochætes in the spinal cord of tabetics until 1926.

Much of the heuristic ideas upon neurosyphilis, including those of Gowers, were in the nature of guesswork, though surprisingly accurate in many instances. The first of the three lectures concerned pathology. Gowers referred to two elements at work: a process of inflammation (that is the "congestive" element), and a process of tissue-formation. Generally the two elements occurred together as in "hyperplastic inflammation". True inflammation of the nervous elements he regarded as most rare. Indeed it is said that Gowers, who was attending a meeting of the Medico-Chirurgical Society where neurosyphilis was being discussed, was invited to speak. His opening remark was "Of syphilis of the nervous system I know nothing"—the point being, of course, that the pathology mainly affected the interstitial tissues.

The use of the adjective "specific" as an euphemism for "syphilitic" was strongly deprecated by Gowers, who preferred the German expression "luetic".

In discussing syphilis of the cerebral arteries there are references to aneurysmal formations, some of which would certainly to-day be regarded not as luetic but as belonging to the "congenital" or berry aneurysm type.

Without an appropriate serological test it was difficult in those times to prove the syphilitic nature of many clinical problems. Similarly the incidence of syphilis within the community was not known with certitude. He quoted figures from Raymond-Johnson and Marriott to suggest that of the male adult population of London probably 10 per cent. could give a positive story of infection, while in another 10 per cent. there were evidences of a primary chancre of uncertain nature. For some reason the incidence was gauged to be less in Leeds, namely 6·4 per cent. and 6·7 per cent. respectively, according to Littlewood. On the basis of the probable portion which were syphilitic, Gowers estimated the incidence of syphilis, as involving 13 per cent. of the male population of London and 8 per cent. of Leeds.

It has since been said of Gowers that he was prone to diagnose neurosyphilis where others would certainly have hesitated. The percentages just quoted are obviously far higher than present-day figures, and it is open to some doubt whether the statistics he relied upon are not themselves exaggerated.

Strümpell's theory was quoted, namely that syphilitic organisms elaborate a chemical substance which has a toxic effect upon nerve tissues. Hence the resistance of neurosyphilis to ordinary antiluetic measures, and also the bilateral symmetry of so many of the manifestations. Gowers made a good point in discussing whether or not to ascribe a particular clinical picture to syphilis. There were two conditions which he required to see fulfilled, one of time and one of place. As regards the former, he pointed out that syphilitic lesions are neither very acute nor very chronic—*i.e.*, not a matter of minutes or of months but a question of days. As to place, the effects of neurosyphilis were to be looked upon as "random", lying outside the nervous system in the strict sense of the word.

Gowers made the point, which has since been fairly well accepted, that a sudden hemiplegia developing between the ages of 25 and 45 is seldom due to any cause other than syphilis.

When referring to treatment, Gowers said that syphilis was an incurable disease, if by incurable was meant a lack of proof of cure. At the same time he had the impression that physicians often approximated to, if they did not actually at times achieve, an actual cure. He emphasized the danger of long-continued dosage with small amounts of mercury or of iodide, believing that the organism might become habituated to these drugs.

His lectures finished with an appeal for perfect and unbroken chastity as the only sure means of prevention. His sentences no doubt ring an unaccustomed note to-day though not necessarily any the worse for that; "with all the force that my knowledge I possess, and any authority that I have, can give, I assert that no man ever yet was in the slightest degree or way the worse for continence or better for incontinence. From the latter, all are worse morally; a clear majority are worse physically; and in no small number the result is, and ever will be, utter physical shipwreck on one of the many rocks, sharp, jagged-edged, which beset the way, or on one of the many banks of festering slime which no care can possibly avoid."

Much attention was aroused by these lectures, particularly by Gowers' remarks upon the intractability of neurosyphilis. A number of letters in the correspondence columns of the medical press resulted. The other feature that attracted notice was his plea for extramarital sexual abstinence. His remarks were repeated with endorsement in the *New York Medical Record*, and they were the subject of a leader in the *Lancet* (May 25, 1889) approving the content of Gowers' exhortations. On May 28,

Gowers contributed a letter to the *Lancet* announcing that he had reprinted the concluding paragraphs of his Lettsomian Lectures in pamphlet form for lay consumption, and he drew attention to Dr. Clement Dukes's recent Howard Prize Essay upon the same theme.

Many of the points made in the Lettsomian Lectures were reiterated in 1902 in a paper read at the old Medical Graduates' College and Polyclinic at Chenies Street. Conscious of the fact that he was repeating himself, Gowers declared "I have said it before, but a teacher who hesitates to repeat, shrinks from his most important duty, and a learner who dislikes to hear the same thing twice over, lacks his most essential acquisition."

One may turn back to an early paper of his, written in 1879, on "Syphilitic Neuroses". By that expression Gowers referred to the parenchymatous neurosyphilitic disorders. He gave reasons for believing that epilepsy, chorea, and paralysis agitans were not parasymphilitic affections, but that some cases of general paralysis and most cases of locomotor ataxy were. Lateral sclerosis he regarded as an occasional manifestation and progressive myo-atrophy as "not infrequent". Gowers followed in these respects the opinions laid down by Fournier and by Hutchinson. Even at this early date, Gowers was insisting on a clear distinction between syphilitic disorders of the nervous system proper (*i.e.*, the "neuroses") and affections of the supporting tissues (*i.e.*, "adneurial disease").

Gowers' interest in neurosyphilis was maintained throughout his life, and he contributed a number of papers on the subject. We may remind ourselves that his friend Rudyard Kipling wrote a graphic fictional description of tabes in a short story entitled "Love o' Women". One is tempted to imagine that Gowers' expert advice may have been sought by the novelist before the tale was

completed.* Gowers was one of the first neurologists to regard tabes as essentially a sequel of syphilis, and in this view he was a strong supporter of Fournier and of Erb. He was able to adduce clinical evidence of a luetic infection in 80 per cent. of all his tabetics, and he asserted that he had never seen tabes in a person who had not run the risk of becoming infected either in the ordinary way or as a professional hazard—in the case of medical men. Like Neisser he believed that tabes was the result of two factors, namely a syphilitic toxin plus some unknown intensifying influence.

Gowers examined the clinical manifestations closely. The cardinal signs of a tabes consisted, he said, in a loss of knee jerks, ataxia, and muscular hypotonus—or “undertone” as he called it. But this diagnosis was often applied without precision. “Tabes”, he said, “is a word which connotes almost nothing and so may be made to denote almost anything—a convenient characteristic in medical terminology”. Clinical differences he ascribed to minute differences in the chemical character of the toxine fit in, as it were, with chemical differences in the constitution of the nerve elements. He recognized a variety of “partial” tabes with intact knee jerks and no ataxy, but with conspicuous pains—and which he termed “tabetic neuralgia”. He made an intimate study of the pains which tabetics are so apt to suffer, and although admitting that “nature is prone to ignore our divisions, and to blend that which we distinguish”, he hazarded a clinical classification.

He distinguished brief fleeting pains from the prolonged fixed pains. The former, he said, were either superficial (*i.e.*, the true lightning pains) or deep. Superficial pains

* On yet another occasion Kipling probably sought Gowers' technical advice, namely when writing his poem “The Post that Fitted” which deals with the simulation of epileptic convulsions, as a means of avoiding a marriage contract.

were associated with hypersensitivity of the skin to light contacts though painful stimuli might be dulled. Deep pains might cause involuntary startings of the limbs and might be likened by the patient to the twisting of a knife or dragging of hooks within the flesh. The prolonged type of pain might endure for hours or even days in one set place more especially deep in the trunk, often unilateral. Renal colic or sciatic neuritis might be mimicked. Superficial diffuse sensations might also occur, being distressing rather than painful. Concerning the site of the lesion responsible for the pains, Gowers suspected the extremities of the peripheral nerves. Such a pathology seemed to him to explain the cutaneous hypalgesia and also such occasional manifestations as white spots on the skin, and bending or breaking of the hairs in the painful areas. At the same time he thought that disease of the conducting fibres might be responsible for the deeper type of pain.

He prepared an interesting lecture on the dystrophies of tabes and the question of whether or not there were such entities as trophic nerves. He believed that no such structures existed and that the ordinary motor and sensory nerves were alone responsible for changes in the nutriment of the tissues. "There are regions of mortality", he said, "of which the Registrar-General takes no cognizance; one is that which relates to scientific theories. Their death rate is high. Some perish early, launched into existence with defective vitality. Others, more robust, come to a sudden end, due to death in controversial contest. Others, again, at first seem vigorous, but afterwards slowly fade from inanition. Growing knowledge ceases to furnish them with support. The facts on which they seemed to rest are found to have different relations, and that which the theory was framed to explain is found to be otherwise intelligible. Such seems to be the fate of

the theory that the nutrition of the tissues is governed by special trophic nerves and centres distinct from those which influence their general functions ”.

Questions of prognosis and treatment in neurosyphilis were considered in a separate lecture. The two main remedies then available were mercury and iodides ; their mode of action and their therapeutic applicability were quite different. Gowers did not approve the American system of high iodide dosage. Except for brief periods, in very urgent cases, it was unwise to prescribe iodides and mercury together in full amounts, and he suspected that iodine would promote the elimination of mercury. Gowers favoured inunctions of the oleate as the best means of prescribing mercurials. Specific treatment, in Gowers' opinion, should be energetic, brief, renewed, and not continuous. Prolonged medication was liable to habituate the organism to the remedy. This opinion was supported by the case of a man under his care with a cerebral syphiloma. Under treatment with potassium iodide (gr. x thrice daily) the symptoms cleared up. He continued to take this medicine, however, and after three or four months he developed rapidly progressive spinal manifestations from which he died. At the autopsy the scar of a healed luetic cerebral lesion was found, and in addition there was a recent gumma of the spinal meninges. Gowers believed that after about eight weeks of adequate treatment the active and specific disease process would come to an end, but, of course, compressed nerve tissue might continue to improve steadily over a much longer period. This favourable progress should not be ascribed to any medicament that happened to be prescribed in continuous form. Cicatrices in nervous tissues could of themselves produce enduring symptoms or signs and they should not be regarded as evidence of active syphilis, nor as indications for anti-luetic measures.

1894. ÆT. 49

In October 1894 Gowers gave an address to the Medical Society of Manchester. He chose an unorthodox topic and one which to-day makes unusual reading. The title of his paper was "The Dynamics of Life". Obviously stimulated by the life-long pursuit of his colleague, Bastian, into the genesis of living organic matter *in vitro*, he turned to the recent Croonian Lectures by Ramon y Cajal on the structure of the neurone. Lastly, he coupled these biological ideas with the recent work carried out by Arrhenius, William Crookes and other physicists on atomic and molecular structure. Gowers sought to apply these data to the problem of nervous energy. He embarked upon this lecture cautiously, using simple precise language even when discussing philosophical concepts. He was careful to define each new term with exactitude. As he warmed to his subject his style changed and his concluding paragraphs betrayed some of the more flamboyant writing common in that age, but unusual with him.

It would be an exaggeration to say, with Oscar Wilde, that "he found a curious pleasure in tracing the thoughts and passions of men to some pearly cell in the brain, or some white nerve in the body, delighting in the absolute dependence of the spirit on certain physical conditions, morbid or healthy, normal or diseased". Yet Gowers was searching for the origins of the tremendous energy manifested in a typical epileptic seizure. He started with the notions of latent chemical energy, and the inter-atomic movement of matter. The reception of a stimulus affords an additional amount of energy and brings about a change in shape of the atomic mass. These physical concepts were then applied by him to the dynamics of the impulse along a nerve fibre. He believed that transmission from one neurone to another in contiguity is brought about by

some chemical intermediary. Turning to the dynamics of life itself, he was sceptical of materialistic hypotheses, "of the relation of energy to life itself there is, it seems to me, nothing to be said. Nothing is to be discerned. Not only is the relation of energy to vitality entirely hidden from us now, but I can see no promise that the future has it in store for us. The hand that holds the secret is tightly closed." Later, "the term 'vital energy' which echoes around us in tones to which we would fain close our ears, is a term which describes a conception that, so far as it is possible to discern, has absolutely no counterpart in fact corresponding to its common meaning. Beyond the physical energy of the processes of the body, we know nothing of anything to be designated by the name."

The biophysics of disease was then discussed more closely, as exemplified by epilepsy, and the influence of metallic poisons on peripheral nerves. He speculated upon the nature of inhibition and was tempted to relate it to an increase in intra-molecular motion, tending to resist the escape of atoms.

Gowers' peroration was on a mystical note: "Search as we may, with eyes however earnest and however aided, that which we call 'Life' eludes our search and resists our efforts. We may indeed trace the relations to vitality of matter and of the energy it bears—their entrance into the domain of Life, their exit, their effects. We seem them dimly shadowed now and then within the luminous mist, but the mist obscures our sight, and the light it radiates hides by its own brightness. We must be content with what knowledge we can gain, secure or insecure, and, while using it as best we may, should realize in all humility how much there is we cannot know, and yet we cannot doubt."

THE SOCIETY OF MEDICAL PHONOGRAPHERS, 1894-1913

ÆT. 49-68

It will be convenient to interrupt the narrative of Gowers' writings here with an account of his absorption in the value of shorthand, to mankind in general and to medical men in particular. During his apprenticeship at Coggeshall, Gowers was introduced to this study. He quickly saw its advantages, learned it, and thereafter utilized it widely. To gain speed he used to attend church and record the sermons verbatim.

As a neurologist he wrote his private case-notes in shorthand within small black leather notebooks. He persuaded his wife and children, and many of his residents and assistants to learn the art, and he was in the habit of corresponding with them on postcards written in his very neat shorthand script. Any young doctor who knew shorthand at once won his interest and commendation. At the bedside during his ward rounds he would often produce a small pocket-book and jot down a few rapid symbols recording an unusual point. It has been neatly stated by an obituarist that "in a previous generation, when neurology was more feared than studied in England, if a man knew this subject well, and especially if he carried an ophthalmoscope ready for use in his pockets, he was probably an old student at Queen Square ; and if, in addition, he could write shorthand, almost certainly one of Gowers' house physicians there".

In December 1894 he founded and became the first president of the Society of Medical Phonographers. The original members numbered sixty. His inaugural address

concerned "The Art of Writing in relation to Medical and Scientific Work". This was a plea that students should learn shorthand before starting their medical career, for it could easily be acquired during the long vacation. Indeed this recommendation had already been made to the General Medical Council by Sir Dyce Duckworth and Mr. Wheelhouse. The task was not arduous; Gowers reckoned that two hours' daily practice would enable the beginner in a fortnight to write as fast as with longhand, and full practical use would be achieved in a month. The advantages comprised a speed three times that of longhand, more than three times the ease of writing, and a far greater legibility. Always a methodical note-taker, Gowers did not believe that the constant practice of making memoranda in any way detracted from the acquisition of a good memory.

The Society issued a little journal printed in shorthand, entitled the *Phonographic Record of Clinical Teaching and Medical Science*. James Taylor, collaborator in the third edition of the Manual, was the original editor. The first two numbers were produced privately, but after the third issue in January 1895 it was put on the market, being printed by Pulman's of Thayer Street, and published by Sir Isaac Pitman and Sons.

By April 1895 the Society numbered 139 members, Dr. Neil of Warneford Asylum being the Secretary. Gowers contributed a considerable number of short clinical papers to this journal, some of them anonymously. A special address to the Phonetic Shorthand Writers' Association on "The Element of Art in Phonography" was among them, and reprints were issued to those who were interested. Undoubtedly Gowers devoted more time and attention to this hobby-horse than it really deserved. Most, if not the whole of his literary output of the years 1894-1902 was given up to the *Phonographic*

Record where the articles have since remained concealed from the general medical public. He wrote a series of clinical jottings under such generic titles as "Some Problems in Practical Diagnosis", "Cases and Comments", "Insurance Notes". Few, if any of these, have been transcribed into longhand and few to-day know of their existence, buried in obscurity and locked up in code.

On November 25, 1897, the Society held a congratulatory dinner to Gowers on the occasion of his knighthood, at Limmer's Hotel, George Street, Hanover Square. There was a large attendance of members and guests, and speakers included Sir William Broadbent, Sir William Thomson, Sir Howard Marsh and Mr. Rudyard Kipling.

In January 1899, Gowers vacated the Chair in favour of Sir William Thomson, President of the Royal College of Surgeons of Ireland. In 1903, David Ferrier, Gowers' colleague at Queen Square, became president. In 1908 Gowers was elected president of this society once again. But the heyday of the Society was over. Despite an appeal in the Medical Press for new members, interest was flagging. By 1912 the Council reluctantly decided to wind up the Society owing to dwindling members, lack of interest and shortage of recruits. The last president was David Goyder of Bradford, and the last secretary Hill Joseph of Bexhill. So, with the seventeenth volume the interesting series of shorthand journals came to an end. The collection is rarely seen nowadays and possesses little attraction except to medical bibliophiles.

1895. ÆT. 50

For his Bowman Lecture before the Ophthalmological Society in 1895, Gowers chose the theme "Subjective

Visual Sensations". Most of the lecture was occupied by a description of the hallucinations which may be experienced by the epileptic or the migrainous. He had a number of interesting plates to illustrate the latter, some of them being taken from Dr. Airey's earlier account, but others were drawn by two of Gowers' patients, an artist and a draughtsman. The original plates were presented by Gowers to the Ophthalmological Society though their present whereabouts are not known.

Gowers also put forward an unorthodox conception with regard to visual disorders in hysteria and after cerebral disease. He suggested that in addition to the occipital half-vision centre, there existed another, higher in a physiological sense, located near the angular gyrus. Both visual cortices were, he believed, connected with each angular convolution, but in such a way that the visual field of the opposite had a greater representation than that of the homolateral side. Hemianopia does not occur as a hysterical manifestation, but in its stead, a "crossed amblyopia". In this condition peripheral vision is lost in both eyes; central vision is retained but its area is always greater one side than the other.

Anticipating by some years von Monakow's conception of diaschisis, Gowers referred to the fact that an acute occipital lesion which causes hemianopia may also for a few days bring about a complete and bilateral loss of vision. This he ascribed to a process of irritative inhibition of the visual centre on the undamaged side. He had some original observations on colour vision. In his opinion the peripheral field for colour was larger if both eyes were open, a phenomenon he named "binocular intensification". Moreover, the areal colour field could be extended, he thought, by interposing a small white area in the centre field of either eye.

1903. ÆT. 58

Yet another unusual address was delivered by him in 1903 before the Medico-Psychological Association of Great Britain and Ireland. Taking as his theme "Lunacy and Law", Gowers showed the hardship that borderline patients were often suffering under the operation of the new Lunacy Acts. His suggestion was that there should be an alternative system of compulsory notification, whereby anyone who received an early mental patient in return for payment should notify this fact. Commissioners could then visit the patient if they thought fit and would order certification if deemed necessary. He made a novel suggestion as to the phraseology of the certificate; the word "not" might well be interpolated, he said, so that the formula would run "so and so is a person of unsound mind and is *not* a proper person to be detained".

Like others before him and since, Gowers thought the disposal of lunatics was managed better in Scotland. He was against the existing divorce between general medicine and psychiatry, and of the latter he said, "the care of the insane is more than a specialism . . . it is an exclusivism." On the Board of Control his comments were "I suppose in every commissioner one cerebral hemisphere becomes legal and only one can remain medical".

"Lunacy and the Law" proved a provocative address and stimulated annotations, leaders and a number of comments in the Press. Some of the correspondents supported him warmly. Others, like Ernest W. White, were critical of his suggested reforms, and defensive of the *statu quo*.

1904. ÆT. 59

January 16, 1904, saw the birth of the word "fibrositis" which proved a *veni vidi vici* of medical terminology. In a

lecture published in the medical press of that date Gowers discussed the common condition of lumbago as though from personal and painful acquaintance with the malady. He spoke of the recent researches on the endings of the muscle afferents and the paradox that the acute pains of lumbago and cramp should be produced through the muscle-spindles, which are structures that normally give rise to no sensation. Gowers gave reasons for regarding lumbago as a disease of the fibrous tissue of the muscles which may spread to their attachment to the iliac cord ("tendinous lumbago") or to the vertebræ ("sacral lumbago"), or even by way of the fascia to the sheath of the sciatic nerve. "I think we need a designation", he wrote "for inflammation of the fibrous tissue . . . we may conveniently follow the analogy of 'cellulitis' and term it 'fibrositis'." . . . There were certain peculiar features upon which he commented; the absence of inflammatory products; the extreme suddenness of the onset of symptoms.

Gowers did not appear to have recognized the existence of "nodules" as part of the clinical picture of fibrositis. But among the numerous letters to the *Journal* which followed Gowers' article, one—by Dr. G. B. Jacobi—drew attention to these structures. There were various comments from spa doctors, one at least protesting against attempts to burden pathology with outlandish terms, new-fangled hypotheses and romantic narratives. But Gowers was not to be drawn by attacks of that sort, and deigned to reply only to the serious points raised by Edgeworth of Clifton.

"Lectures on Diseases of the Nervous System," second series, were also published in 1904. The volume included the Bowman Lecture for 1895, already discussed. His Bradshaw Lecture (1896) on "Subjective Sensations of Sound" also finds place here. There was a long discus-

sion on the types and mechanisms of aural tinnitus. He mentioned the noise heard in the ears when one screws up the eyelids tightly, due to forceful associated contraction of the stapedius muscles. He pointed out that the stapedius guarded the tympanum against excessive stimuli just as the orbicularis protected the organ of sight, and that both muscles were within the domain of the facial nerve.

Of particular interest is the well-known lecture on abiotrophy, first delivered at the National Hospital on February 21, 1902. "We do not apply the word death", he wrote, "to slow decay of the elements, we speak of it as degeneration, but the process is in many cases, perhaps in most, an essential failure of vitality. . . . I am met with the difficulty that we have no word by which to designate this conception—a degeneration or decay in consequence of a defect of vital endurance. I do not like new words—indeed, I dislike them—but if we have a conception for which no name exists, which we need frequently to speak of, it is not wise, I think, to shrink from an attempt to give it a name". As examples of cutaneous abiotrophies, he cited baldness and greying. The dystrophies represented muscular abiotrophies. Hereditary spastic paraplegia and Friedreich's ataxia were examples of an abiotrophy within the nervous system. Leber's disease was an optic abiotrophy.

This term has passed into neurological language though not without attempts to dislodge it. Oppenheim spoke of a "congenital inferiority"; Wilson of a "neuronic decay", which does not, however, indicate the limited viability of the system in question. Circumlocutions such as "wearing out of a congenitally inferior system" (Bing), or "a congenitally short span of life of single parts of the nervous system" (Adler) are clear enough, but too clumsy for frequent usage.

This volume of collected papers also contains his

account of the distal variety of myopathy, which, as already mentioned, would probably be diagnosed to-day as a case of dystrophia myotonica. A lecture on metallic poisoning, delivered at the National Hospital on October 22, 1901, dealt mainly with plumbism but also contained incidentally his striking diatribe against the term "neurasthenia". Other lectures included in this collection are: "Syphilitic disease of the Nervous System"; "Inevitable failure. A Study of Syphilitic Arterial Disease"; "Syringal Hæmorrhage into the Spinal Cord". Apropos of this case, there is a letter extant from Gowers to Barnes, "4th April 1903. I have not met with anything about the subject (*i.e.*, syringal hæmorrhage) yet. As far as I have seen the idea of definite symptoms seems new, but I never believe in the novelty of anything—except in the sense of the sunrise". Two final chapters include "The Use of Drugs" and "Myasthenia and Ophthalmoplegia". In this last paper, which appeared originally in German and later in the *British Medical Journal* for May 25, 1902, Gowers refers for the first time to the peculiar nasal or levator smile, or "myasthenic snarl", which is so characteristic of that disease.

He drew an analogy with the snarling grimace by which monkeys express pleasure. It raised the question whether animals possessed zygomatic muscles. To secure comparative anatomical material for this paper, he got his assistant, Dr. Finny, to visit the Zoological Gardens and to make dissections of the facial muscles, which showed that zygomatic muscles were present in animals though of different form from man.

1906-1908. *ÆT.* 61-63

Gowers was now contributing short clinical papers to the new *Review of Neurology and Psychiatry* which had been

started in Edinburgh in 1903, under the editorship of Alexander Bruce. The first article in the first issue of this readable little journal comprised a paper by Gowers upon "local panatropy". The patient had originally been seen in 1885, and went back to his home in Wolverhampton. A recent case of the same sort shown by Dr. Harry Campbell, stimulated Gowers to trace his previous patient and with the help of Dr. Stanley Barnes, the patient was visited and re-examined.* As an interesting example of a methodical follow-up system, it may be said that Barnes in 1939 again wrote a progress report on the patient's condition as it was in 1931.†

The fourth volume of the *Review* contained two articles by Gowers. In the first he went into the question of facial and other cranial nerve palsies which may occur in the course of the Parry-Romberg syndrome, or progressive facial hemiatrophy. This particular complication he ascribed to atrophy of the skull bones with stenosis of the foramina and compression of the nerve-trunks. The other paper reverted to the question of tetanoid chorea and its association with cirrhosis of the liver. Gowers was ill-served by his pathologist, for at autopsy no obvious changes were noted in any part of the nervous system. It is clear that the degeneration in the putamen was completely missed.

Volume 5 (for 1907) contained three articles. The first dealt with tabetic atrophy of the auditory nerve, the deafness therefrom being characterized by a "biterminal" reduction of hearing, and by "auditory scotomata". A paper on "Psycho-epilepsy" came next, a term given to short attacks of some sudden emotion such as fear, dread,

* The case was also written up by Stanley Barnes alone. "Report on Sir William Gowers' Case of Local Panatropy," read before the Clin. Soc., February 13, 1903, and reported in *Clin. Soc. Trans.*, Vol. 36, pp. 1-5.

† Stanley Barnes: "Gowers' Case of Local Panatropy," *J. Dermat. Syphil.*, 1939, 51, 377-380.

depression or apathy. As to the last, he queried whether a paroxysmal mental inertia might not represent a condition of the brain, which, if compressed into a moment, would have entailed loss of consciousness. He believed that these psycho-epileptic attacks may come into the picture of the "extended" type of vasovagal turns which he had described some years before. The third paper was a report of a case of narcolepsy. He repeated his warning as to the difficulty in excluding a *petit mal* which he regarded as the more probable diagnosis in a doubtful case.

To-day, and in the light of our ideas as to the electrical and humoral aspects of the nerve impulse, it is interesting to turn to a much neglected paper of Gowers' entitled "Dendrites and Disease." Gowers suggested that if the branching processes of a nerve cell are called dendrons; and their branches dendrites, then the ramifications of the axons might be termed "axites" and that the dendrites and axites together might well be spoken of as "neurites". As on other occasions Gowers was misled by accepting unreservedly the writings of those neuropathologists and neurophysiologists, whose dogmatism was greater than their accuracy. The studies on the finer structure of the nerve cell and its processes had appealed very much to Gowers who saw in their work considerable scope for speculation along the lines of pathology. The important point seemed to be that neurones were structurally separate one from another; that their processes did not unite, but ended in continuity with them. Nervous conduction from one neurone to another would therefore have to surmount a gap: indeed, conduction really amounted in the strict sense, to a process of stimulation relayed from one neurone to the next. Such a conception was to Gowers pregnant with possibilities. It indicated that there was a microscopical hiatus as it were at the synapses, where a wealth of disordered function might arise and

elude anatomical demonstration. Thus the possibilities that the dendrite is contractile or retractile would raise the possibility that this synaptic gap might be widened, or narrowed. Here we see the declaration of what came to be called Gowers' theory of sleep, depending upon a temporary and periodic dendritic retraction. Forceful stimuli might surmount the gap and cause wakefulness. Incomplete retraction might account for somnambulism and talking during sleep. Within this same hypothesis of dendritic discontinuity and mobility, Gowers also saw a possible explanation of the lessened resistance brought about by the repetition of a particular action. He speculated that chorea might be due to a dendritic disorder of motor impulses in the cortex; that the tremor of paralysis agitans might lie in a senile decay of the dendrites of the motor cortex, and he drew an analogy with the passing tremor of emotional shock. Dissociation-phenomena such as an hysterical hemianæsthesia might be visualized as due to a localized dendritic retraction, so that sensory stimuli failed to reach consciousness.

Unfortunately these interesting surmises stand or fall by the accuracy of the histological groundwork. Time has indeed shown the errors, and the discontinuity of the neurone and tractability of the dendrites is no longer taught. Indeed, Dr. John Turner, who was more in touch with the van of neurohistology than Gowers, pointed out in a letter to the *Lancet* that such newer techniques of interval staining as the use of methylene blue rather than silver preparations had killed the conception of neuronic isolation.

We may turn to the valuable monograph he published in 1907 on the "Borderland of Epilepsy". Some of the chapters had already appeared in the medical press. Chapter I dealt with "faints" and is a piece of medical writing which should not be overlooked to-day. He

referred once again to his hypothesis of the retraction of dendrites as a mechanism underlying loss of consciousness. He believed that there were links between epilepsy and syncope. Those prone to faint are apt to do so with more and more facility and abruptness. Later they may tend to faint spontaneously; in other words to be transformed into a minor epilepsy. Thence he passed to the conception, since accepted as classical, of "vagal" or "vasovagal attacks". He gathered within this category a number of phenomena which had previously been noted briefly, and described under various terms, *e.g.*, the angina vasomotorica of Nothnagel, and the syndrome médullaire of Bonnier. The clinical features of these interesting attacks were described in detail. He traced an analogy with what he called "extended epilepsy" where the elements of an epileptic seizure are drawn out or lengthened as it were, so as to reduce its intensity but not its distressing qualities. For the relief of vasovagal attacks Gowers recommended nitroglycerine. The first appearance of this lecture attracted no little interest as evidenced by the correspondence columns of the *Lancet*. Leonard Williams was faintly sceptical of the propriety of the term "vagal". Gowers in his reply asserted the identity of his vagal syndrome with the "Vasomotor Angina" of Douglas Powell and the "pseudo-angine névrosique" of Herchard.

Two chapters on vertigo contain many clinical points of value and again he stresses those cases which seem to take up an intermediate position between aural vertigo and minor epilepsy. Throughout his career vertigo was a subject which never failed to interest him, and periodically he wrote upon this theme. His first essay was delivered to the British Medical Association at Sheffield in 1876, and it appeared a few years after a paper by Hughlings Jackson who, too, maintained an interest in the symptom.

Possibly his early association with Russell Reynolds played some part, for this former chief and sponsor had in 1854 written his little monograph "On Vertigo". Gowers realized quite early the importance of derangement of hearing in the ætiology of vertigo, though aware that the deafness might be so slight as to deceive the patient and to elude superficial testing. Defective bone conduction, or "perosseal audition" as he called it, was particularly significant, and he used a watch as well as a tuning fork for this test, pressing it against various regions of the cranium. A close discussion of the distinction between auditory vertigo and gastric vertigo led Gowers to the belief in the far greater significance of the former. Digestive derangement might be merely a precipitating factor in what is really an aural type of vertigo. Differentiation from cerebrovascular accidents was often difficult, especially in the very abrupt cases of apoplectiform vertigo. The resemblances to epilepsy, especially minor attacks with an aura of giddiness, were familiar to him. When treatment came up for consideration Gowers spoke highly of the bromides which he believed most efficacious, especially if combined with belladonna, or with carbonate of bismuth.

Concerning the clinical phenomena of vertigo, Gowers said that there might merely be a sense of movement, but that if the sensation was intense, actual movements would occur, and this always in the same direction as the sense of movement. This point was significant to Gowers, as it was to Hughlings Jackson, in suggesting that vertigo was actually a motor sensation—the effect upon the sensorium of motor processes. External objects might seem to move, usually in the direction of the victim's own movement. Occasionally the sense of movement would be in the opposite direction, a fact Gowers found difficult to explain. He emphasized that the disturbed motor and sensory

relations in vertigo were complex in nature. Various functional levels of the neuraxis might be involved. A tendency to move might cause a compensatory and opposite action of the centres to preserve equilibrium, which in some cases might be excessive.

The "Borderland of Epilepsy" also contains a chapter dealing with migraine and again he emphasized the similarities between this disorder and epilepsy. The treatment he advised consisted first in liquor trinitrini—or, if that failed, bromides combined with phenazone or with cannabis indica.

The last chapter concerns "some sleep symptoms". There is a fascinating account of certain subjective pre-dormital phenomena, such as sudden starts, or auditory impressions, or feelings of powerlessness, or of jactitation. Gowers pleaded for a word such as "sleepening" or "somnolescence" to refer to the opposite condition to "awakening". Night-terrors and somnambulism were discussed. Under the term "half-waking somnambulism" Gowers gave an account of those transitory states where there is a loss of power to move or speak though consciousness is clear. To-day we recognize the phenomena as "waking paralysis" or "sleep-paralysis". The opposite state might appear wherein consciousness is imperfect, but speech and motility are intact. Gowers gave the explanation that is accepted to-day, namely of a dissociation between the various levels of sleep. Gowers was interested in Gelineau's narcolepsy, first described in 1880. He regarded it as a comparative rarity and thought that most doubtful cases were really instances of epilepsy. He did not understand how a writer like Friedmann could have collected as many cases of narcolepsy as fifteen. To find that number Gowers thought it would be necessary to scrutinize at least 30,000 cases of epilepsy. Prolonged states of sleep were also mentioned by Gowers who

proposed for them a revival of the discarded term, "somnosis".

This monograph received considerable attention and was translated into German by Dr. Ludwig Schweiger of Vienna.

Gowers gave, in 1908, one of his rare addresses to the Neurological Section of the Royal Society of Medicine upon the Mechanism of Nystagmus—another example of detailed clinical observation. The same year he published a curious case of a bulbar affection, under the title "Pseudo-myasthenia of Toxic Origin" (petrol fumes).

1909-1910

During this year Gowers received the honour of delivering the Hughlings Jackson Lecture, perhaps the highest compliment open to workers in the field of nervous diseases. The distinction was all the greater in Gowers' case because the appointment lay within the province of the Council of the Neurological Society—a body which he had always refused to join until it became, in 1907, a section of the Royal Society of Medicine. Four neurologists before him had delivered this lecture, namely, Jackson himself (1897), Eduard Hitzig (1900), Broadbent (1903) and Horsley (1906). The subject of Gowers' address was "Special Sense Discharges from Organic Disease", and he described the various auræ which might occur not only in idiopathic epilepsy but also in organic brain disease. He brought forward more evidence to suggest that the angular gyrus served in man as a higher visual centre.

One of the last papers that Gowers wrote, already a very sick man, was an important one, describing "a case of unilateral optic neuritis from intracranial tumour". The

case is significant in that the clinical picture of papill-œdema in one eye, with optic atrophy, central scotoma and a sluggish pupillary reaction on the other side, together with bilateral anosmia, was associated with a tumour lying on the orbital aspect of the frontal lobes. This syndrome has of course since been associated with the name of his pupil, Foster Kennedy, who described other similar cases later. But Gowers not only deserves priority but he also succeeded in finding a comparable case-report made four years earlier by Schultz-Zehden.

A few other short papers also appeared in the course of 1909, especially in the *Phonographic Record*. During 1910, his last three articles were penned with considerable difficulty. These papers dealt with poliomyelitis, with gonococcal neuroretinitis, and with the neurology of the eyelids. One sees in this last communication a flash-back of his interest to the studies made when he was an assistant physician in his early 'thirties.

GOWERS AS A NEUROLOGIST

In Victorian days men of all professions were more picturesque ; more colourful in speech, manners and sometimes in dress. To-day we are moulded into a certain mediocrity, and though the general level of technical attainment may conceivably be higher, we fail to achieve the domination reached by many of the leaders of the profession one or two generations ago. We are spared their eccentricities, their foibles, it is true ; we also lack their culture and their personalities.

Gowers was a worthy representative of that age of great men. A strong and highly distinctive character, his temperament and his work were closely knit. Rising from humble and straitened circumstances, he took the fullest advantage of the short years of schooling. By a combination of diligence and merit and stimulated by a constant itch for knowledge, he attained pre-eminence in his own speciality, as well as a high level of general learning. Like Walter Pater whose obsessional perfectionism was not dissimilar, he burned with that hard gem-like flame which in later years could not fail to bring success.

In neurology he stands as the apogee of the great clinician. His role was a twofold one, that of an accurate diagnostician, and that of a teacher. In the former capacity he relied on close application, keen observation, a brilliant memory, a methodical system of case-recording, and painstaking physical examination. He did not indulge in lightning diagnoses, but he could when he so desired make a dramatic point in clinical observation. Thus, at a clinic on a case of plumbism, " I was told that it seemed to be a case of ' simple neurasthenia'. I looked

casually at the bed-card and at once my eye was caught by the record of his occupation 'Painter'. I looked from the bed-card to his gums, and there I saw written in equally distinct characters the record of the effect of his occupation—in a conspicuous lead-line”.

He visited his wards more often than his colleagues, perhaps three times a week. Seated by the bedside he would carefully read the case-notes made by his assistant. Once again he would go over the points in the history, elucidating, elaborating. His own examination would follow—full, detailed, but without the tedious slowness of some other neurologists. A clinical point, or an unusual symptom or sign would attract his attention. He would perhaps send for a copy of his Manual to verify an observation. Often he would produce his pocket-book and make some shorthand memorandum which at home would be amplified and indexed for later reference.

The basis of his assessment of the problem was hence solid and substantial. Aided by an adequate knowledge of neuropathology as it stood in his day, and by a thorough grounding in neuroanatomy, he interpreted his observations scientifically. Hence he did not have to rely on clinical memory, or clinical “instinct”—useful though they were to him. There was nothing flashy or meretricious therefore in his bedside technique.

Hence it was that his diagnostic accuracy proved uncanny. Residents of the National Hospital are often cynical of the out-patient diagnoses made by their chiefs, and yet there was a saying that if Gowers admitted a patient with a certain diagnostic label, the odds were a hundred to one on its accuracy. Indeed, it was said of him that he could not make a mistake if he tried.

None the less it is sometimes asserted that Gowers had a few diagnostic blind-spots. His proclivity for attributing lesions to an old syphilis has been mentioned. There was,

it is averred, an undue reluctance to recognize disseminated sclerosis—though in 1895 he gave an informative clinical lecture on that subject which has never been published. Another diagnosis rarely on his lips was that of functional nervous disorder, or any one of its synonyms. The publication by Thomas Buzzard of a work on the differentiation of organic nervous disease from hysteria was said to have been a source of irritation to Gowers. Certainly the use of the term “neurasthenia” would annoy him, as indicated in one of his clinical lectures . . . “Let me interrupt my special subject for a moment to consider the diagnosis that has been made. The history of the word “neurasthenia” is noteworthy. It is a contribution to medical nomenclature which we owe to our transatlantic brethren, and it attained universal use with the utmost celerity. The concise and concrete character of the word gives it a satisfying definiteness. This depends to a large extent on its classical and somewhat graceful sound. Not only is it graceful to the ear, but it is graceful to the mind of the patient who suffers and longs to know from what, who longs to have a name for that which he, or more often she, feels must be a more definite malady than is suggested by the commonplace designation of “nervous weakness”. It has firmly established itself in current clinical terminology. But it often tends to be too satisfying. Men are apt to rest on it as they would not on its English equivalent. If they do not actually think they have found the malady from which the patient is suffering, an influence is often exerted on them of which they are unconscious, which lessens the tendency to go further in the search for the whole morbid state. Words are our servants, but they often exert a very masterly influence upon us, none the less effective because we are not conscious of it. They have also their own vitality, feeble or vigorous, and we

have little power to influence their career. . . . The general use of the word 'neurasthenia' was in spite of a strong objection to it which was felt by many. The Royal College of Physicians of London could not include it in their "Nomenclature of Disease", and yet it is now one of the most common of medical words in every language. It would be constructive in more than one way to have a careful study of the forces which influenced its career, but that I cannot attempt. We must, I think, admit that not only is it a satisfying word to those who suffer, but it has a certain convenience which has almost compelled many to employ it who at first objected. If I may be pardoned for a partial paradox, its convenience is none the less real because this rests on features that are illusory. Remember that the word is a name which should have little meaning even to those who used it. You may employ it to collect the symptoms of the case under a general designation, but do not let it cover them as a cloak".

Gowers was not a weaver of hypotheses; nor a clinical philosopher like Jackson. But he was none the less an original thinker, and in his handling of case-material he had a most keen eye for the unusual, the novel, the unrecognized. Perhaps it was his training in natural history which helped him not only to identify, arrange and classify, but to pick out the rarities and the new species. Strict clinical honesty was one of his characteristics, and was coupled with an accurate memory. Exaggeration was completely foreign to his nature, and he disliked intensely this trait in others. He never forgave a colleague he caught out as guilty of medical humbug.

Victorian physicians had little opportunity of recourse to ancillary aids to diagnosis, but those few means available Gowers used with skill and intelligence. He was an early advocate of clinical ophthalmoscopy and he also taught that this instrument could be used for examining

an ear-drum, or for searching for a lead-line in the gums.

Gowers' second order of brilliance in neurology lay in his genius as a teacher. Clinical lectures had been instituted in 1879 by Thomas Buzzard and Hughlings Jackson every Thursday at Queen Square. Later, the out-patient and in-patient practice of the Hospital was open each Monday, Tuesday, Thursday and Friday. It became noised abroad that those attending on Gowers' day would not be disappointed. His teaching clinics soon became thronged with physicians from all over the world standing in the gangways and straining the capacity of the accommodation. Gowers was able to combine teaching with out-patient consultations, and he set the practice which has been followed ever since. He was not aware beforehand of what cases were attending and he saw the patient for the first time in the presence of a critical and admiring audience. He took the history, examined the patient, and afterwards discussed the nature of the case, the differential diagnosis, prognosis, and treatment. There was no set talk; no questions or answers. The whole performance was a type of thinking aloud which could be witnessed profitably by medical men however skilled or experienced.

In the case of a prearranged lecture the procedure was different. Gowers would decide upon the topic and then would write out the text in full. This would be corrected and polished, but when the time came Gowers did not read the text, but used his script merely as an *aide-mémoire*. Later, the lecture might be published in one of the medical periodicals, and perhaps still later would be issued in book form or in a symposium.

If clinical cases were to be shown, careful arrangements were made beforehand with his house physician. Gowers was well aware of his skill as an instructor, and was even guilty of a certain justifiable vanity in respect of his powers

of attracting large audiences. Like Jenner, he had a curious dislike of women doctors attending his clinics, whereby he was rendered ill at ease and even embarrassed. But he did not have the flippant touch of his contemporary at Oxford, Professor Pritchard, who said apropos of women attending his classes, "God forbid that I should deny the light of His truth even to the meanest of His creatures." An interesting postcard to one of his house physicians illustrates this foible, "17th January, 1896. . . . I thought all those ladies were Americans, and if so I thought I might have invited them to come round with me on Saturday. If they are from the School of Medicine for Women, it is a different matter and, of course, I shall take no notice of them. The whole question however rather inclines me to feel more strongly than I did the undesirability of having the lady students in the Hospital. I think everyone of the *Physicians* of the Hospital beyond myself is strongly opposed to it but I think some of the Assistant Physicians may be in favour of it. I don't think there is the slightest chance of their being admitted at present. I don't suppose there would be objection to a lady pursuing research in the laboratory but that is another thing. I would teach them and examine them separately. But yesterday shows the practical inconvenience of the presence of ladies. Sincerely yours, W. R. Gowers."

But Gowers was not a rabid misogynist and we find him in one place paying a warm tribute to the work on diplegia done by Dr. Sarah McNutt "whose investigations constitute, I think, by far the most valuable contribution to medical science that the profession has yet received from its members of her sex."

How can we moderns evaluate his prowess as a teacher? Nowadays we all achieve a certain competence, but Gowers was pre-eminently a virtuoso—stimulating, arrest-

ing, informative. Like other great Victorian figures he had more than traces of the showman in his technique. It was Gowers who inspired the tradition of neurological didactics—and after his day something of the same genre was continued by Risien Russell, by Collier and by Kinnier Wilson:

His methods in diagnosis and teaching are admirably illustrated in a lecture to University College Students in 1905 entitled "A Metastatic Mystery". He narrated the case of a sudden affection of the 5th, 6th, 7th and 8th cranial nerves on one side. Differential diagnosis was discussed and as the course of the malady was unfolded the malignant neoplastic nature of the lesion became apparent despite the absence of headache. Growths appeared in association with the ilium. When a post-mortem examination became available, a primary tumour was found in the descending colon, and there was metastases in the posterior fossa of the skull, in the pelvis and in the vertebral canal. The lecture displays in a most informative manner the successive steps leading to the full recognition of the clinical problem. Another feature of this lecture was the large number of valuable diagnostic obiter dicta some of which may be quoted verbatim :

"We must always remember it is the balance of evidence that determines diagnosis. The sciences concerned with disease deal largely with probabilities, almost wholly so in internal medicine. The probability varies in degree, but it usually falls far short of certainty. We must learn to take probability as our guide. We have to act. To act we must decide, and to decide we must weigh the evidence, and deal with the probable as if it were certain. Sometimes we shall be wrong, but generally we shall be right ; if we hesitate between two opinions we shall be powerless. Remember that also in practical life, in dealing with

patients, the habit of discerning the probability and acting decisively is all-important. Nothing is so necessary to every practitioner as the confidence of his patients. To gain that he must manifest some measure of confidence in himself. If you must wait before forming even a probable opinion, at any rate be decided in delay. Remember, decisive hesitation is far wiser than hesitating decision. . . ."

"Many cases conform to no recognized type with which we are familiar. This is especially true of cases of diseases of the nervous system. The only way to deal with them is to perceive what the symptoms mean, individually and combined, and to treat each case as if it were a new problem. . . .

"Patients assume, quite rightly, that all symptoms have a cause, and also, often wrongly, that obtrusive symptoms have an obtrusive cause. . . .

"Always scrutinize carefully alleged causes. . . ."

"Cultivate the habit of viewing a chronic case afresh from time to time; ignore what you have thought of it; put yourself in the place of a fresh observer and try and see if it thus bears a new aspect. . . .

"Certain symptoms are very frequent in a given disease; their presence may make that disease certain. But their absence does not prove that the disease does not exist. Neglect of this rule is one of the most fertile sources of error. . . ."

Gowers was interested in therapy and therapeutics as well as in diagnosis. Indeed he deplored any sort of controversy between these two aspects of medicine.

One or two sound contributions to treatment stand to his credit. The use of borax in epilepsy has already been mentioned. He was the first to advocate aluminium chloride for tabetic lightning pains. Nitroglycerine or

liquor trinitrini was another preparation he often prescribed, not only for his vagal or vaso-vagal attacks, but also for the relief of headache. Indeed the liquor is a constituent of what is often called Gowers' mixture, for migraine, combined with the tinctures of nux vomica and of gelsemium, and diluted with phosphoric acid.

Allied to his therapeutics was a sympathetic interest in materia medica, which tied up logically with his botanical knowledge. The typescript of an address to a medical student audience, on "Some Common Drugs" is extant, though the paper was never published.

Unlike Horsley, Gowers played no active part in politics, and it is doubtful whether public affairs or even medical politics interested him.

This cannot be ascribed to insularity or to a one-track mind. We have the evidence of his scholarship, and his interests in nature and art. But in addition, he often took up his pen to defend or illumine a number of paramedical subjects. He advocated strongly the cause of the metric system in pharmacy; he had decided views on the consultant-practitioner relationships; he supported the cult of ambidexterity in young children. To-day it is of interest to find him taking sides with the Royal Colleges against the University of London, as a licensing body in medicine. The University, he declared, should confer a doctorate upon holders of the Conjoint diploma who had taken the whole of their medical education in London and succeeded in passing an appropriate examination. He suggested the signature M.D. (Conjoint) Lond.; or M.D. (Met.) Lond.

Private consulting practice increased so that at one time it became very heavy. He took on an assistant—first Dr. Coleman, later Dr. James Taylor, and was in the habit of utilizing two consulting rooms in his Queen Anne Street residence. Gowers was never a fashionable

physician, however, and certainly never a socialite, so that his face and name were not well known to the public. He never featured in a Vanity Fair cartoon, like many of his contemporaries—Treves, Andrew Clark, Lister, Horsley, Morell Mackenzie, Jenner, Barlow and so on. Yet he received (and prized very much) the "Award of Merit", an illuminated address that was bestowed on distinguished people of their choice, by "Ally Sloper's Half Holiday"—that bizarre item of Victorian journalism.

He did not care for travel and rarely left this country except for reasons of health. Born near London and educated entirely in a metropolitan medical school, he never had the opportunity, like so many of his colleagues, of a continental *Wanderjahr*, or a sojourn in a foreign clinic or a laboratory. Although never in close personal touch with any of his European or American confreres, no British neurologist was better known abroad than he. Similarly, he kept himself thoroughly acquainted with the world's literature of nervous disorder.

Gowers' distinction as a neurologist makes us sometimes forgetful of his abilities as a general physician. Disease of the heart and of the blood did not fail to interest him and we recall his early contributions to the technique of hæmatology. From time to time he wrote short papers on general medical subjects, both early in his career (endocarditis, arteries in Bright's disease, etc.) and (albuminuria and life assurance, renal calculus, hæmoptysis, gallstones, etc.), in the *Phonographic Record*.

Gowers resembled many of his great medical contemporaries, and differed from his successors, in his virtuosity and taste. He was never idle, and he had little or no patience for mere relaxation or even for the reading of fiction. His non-medical interests were of an intellectual or an artistic character.

Reference has been made several times to his botanical

pursuits. He was accustomed to take carefully planned holidays in, say, the more remote parts of Wales in order to study and collect specimens. He was an authority on mosses, and is said to have written a small monograph on the subject.* We can perhaps detect something of an analogy between his minute and patient study of the effects of neurological disease, and the meticulous observation of some of the smaller representatives of plant life. As he himself put it, "no subject (*i.e.*, botany) affords mental training quite so effective for the practitioner's work." † Surprisingly Gowers did not seem to interest himself in the traditions of the Society of Apothecaries. like many previous medical personages—Samuel Dale for instance, who were also natural historians. The very motto of this City Company, taken from Ovid's "Metamorphoses", would have indubitably struck a note of appeal to him, and could well be selected as a fitting epitaph.

Gowers, moreover, was an artist, and here again it was the delicate, almost finicking technique of the etcher and engraver which appealed to him most as a medium. He also did pencil drawings, especially of medical and pathological subjects, with which he illustrated his textbooks. Water-colours appealed to him less, and he did not attempt oils. Gowers boasted that he never had a lesson in drawing, but he studied handbooks on the subject and practised assiduously. His etchings were pleasing and successful compositions and he was very gratified at the honour of exhibiting one year at the Academy. As

* It has not been possible to trace this publication, or any other details of his work as a naturalist. He was never a fellow of the Linnæan Society, nor a member of any of the well-known Natural History Societies. Nor was he associated with the Moss Exchange Club, founded in 1896, which included most of the amateurs of that time.

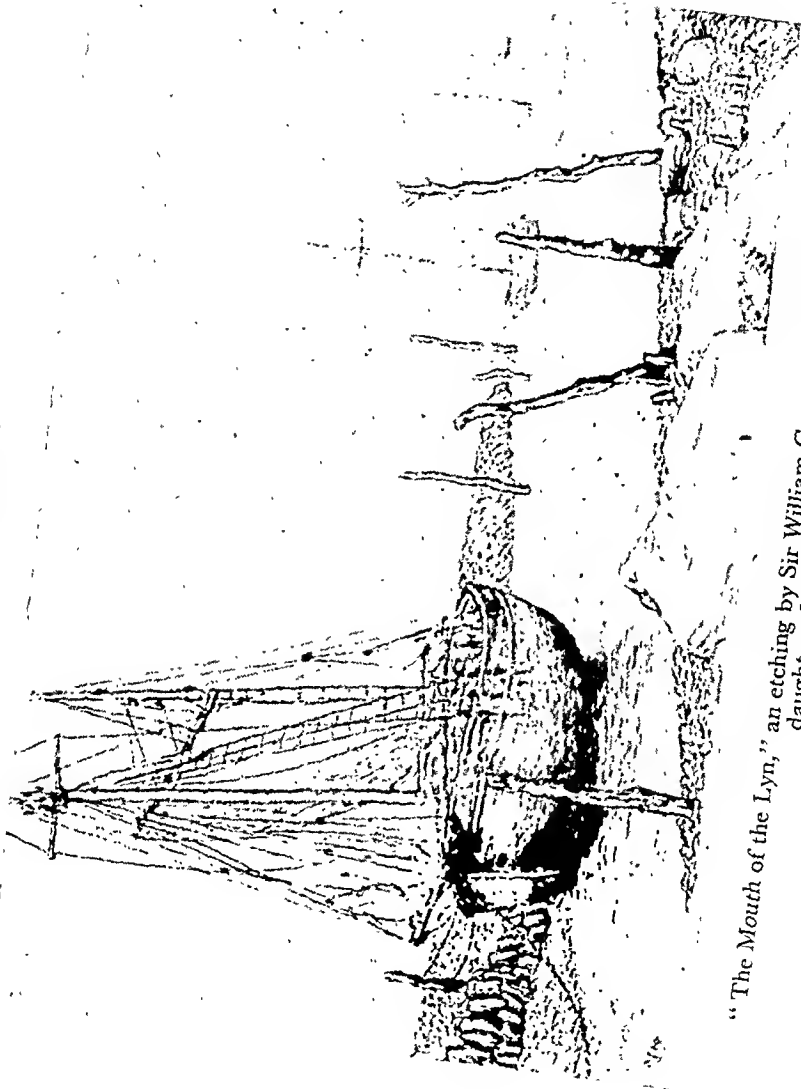
† Sir James Paget was another great advocate of the value of natural history in medicine. "I cannot estimate too highly the influence of botany upon the course of my life. The knowledge was useless; the discipline of acquiring it was beyond price."

with his field work so with his drawings, he would seriously devote his vacation to the development of some aspect. In one holiday he would decide "to do clouds", while in another it would be "ferns" or "grasses". Gowers' etchings show considerable technical skill, though his art was always strictly conventional and orthodox. He was a sincere admirer of Ruskin and though we do not know how much interest Gowers took in the Ruskin-Whistler contretemps of 1877, one may guess which protagonist he favoured.

Antiquarian researches also appealed to him and he loved to study the beautiful old churches of East Anglia. One or two papers were published by him in the *Proceedings of the Suffolk Institute of Archæology*. In the Ipswich Central Library to-day there is a collection of manuscript notes dealing largely with the antiquities of the village and district of Mells; some at least of these papers were the work of Gowers. His lighter moments were given up to chess, billiards and table tennis after dinner with his children.

Music appears to have meant little to him æsthetically, though he took pains to ensure that his children became accomplished instrumentalists. It is strange, therefore, to find Gowers concerning himself in the more mathematical aspects of music, or rather of acoustics. He wrote a plea for an improved scientific designation of musical notes and initiated a correspondence upon this subject in the *Musical News*.

His medical career illustrated his fondness for "gadgets" and he invented or constructed a number of devices. The hæmoglobinometer and hæmocytometer are important evidence of this ingenuity. We recall his "safety hypodermic syringe" as an early accomplishment. Hating idleness, he constructed a reading lamp which he took with him on long railway journeys so that he could see to



"The Mouth of the Lyn," an etching by Sir William Gowers and presented to Susan, daughter of Dr. James Taylor.

work and write. His house in Queen Anne Street held a number of other novel contrivances. At a time when electricity was a rarity his house was so illuminated from a battery in the sideboard. Similarly, he erected a house telephone with a switchboard in his consulting room. Nor were these all the contraptions which his ingenuity devised. He improved the ordinary Duchenne-Charrière dynamometer so as to increase its utility and accuracy. A curious three-wicked candle was invented which would burn with a clear and broad flame rendering ophthalmoscopy easier. To study better the appearance of the ear-drum he thought out a magnifying otoscope. All these pieces of apparatus were constructed for him and put on the market by Hawksleys, who had co-operated with him since his early days. As a young man he had also devised a simple and rapid method of gauging the amount of sugar in urine, based upon the qualitative test of Moore, a general practitioner in Gloucestershire. In this connection, too, belongs his discovery of an unusual type of albuminuria which possibly represented the protein associated usually with the name of Bence-Jones.

Gowers was dignified and distinguished in appearance despite his slight if not frail physique. His hair was worn rather long and his beard was square-shaped and abundant. A premature greying belied his actual age. Other physical characteristics which no doubt endeared him to undergraduate mimics, were his awkward gait and his strident voice. But quite inimitable was the glint of his ice-blue eyes, reminiscent of the ancient mariner—as a pupil of his asserted.

To his colleagues and assistants at Queen Square, Gowers showed himself rather cold and aloof. He was admired rather than liked by those who came in contact with him. His voice was harsh, his speech caustic. Those who were deceived by superficialities, and those

who received the rough side of his tongue, were repelled rather than attracted. In an age of strong personalities, Gowers stood out by reason of his individuality and brilliance. "He did not suffer fools gladly" is a cliché which recurs euphemistically in all appreciations of Gowers, and even towards some of his neurological colleagues—great men though they were—he did not conceal his feelings of superiority.

Gowers has often been contrasted unfavourably with his older colleague Hughlings Jackson, who was easy-going where he was intolerant, warm-hearted where he was difficult.

The legend of Gowers' unattractive personality must not be allowed to survive without pointing out that this was largely a façade which concealed a sensitive kindliness towards those who knew him better, and thereby understood him. His oldest friends remained always high in his esteem. In 1900 we find him going out of his way to publish a letter of appreciation of Sir James Paget who had died a few days previously. His first master, Dr. Simpson; his class-mates Greenfield and Barlow; his earliest chiefs Russell Reynolds and William Jenner; his junior colleagues, Horsley, Taylor, Risien Russell, remained lifelong friends. Another who knew, understood and loved him was that great man Sir William Osler. Attracted on one of his early visits from Canada by the brilliant teaching of young Gowers at Queen Square, a friendship grew up and persisted. When Osler applied for the chair of medicine at Philadelphia, Gowers wrote to Weir Mitchell to support his candidature. Osler dedicated his English edition of his little work on Chorea to Gowers.

In neurology, Gowers often withheld praise; but he gave it ungrudgingly at other times. To Richard Bentley Todd he accorded respect as well as credit for his pioneer

work in identifying *tabes dorsalis*. In his textbook he did not hesitate to acknowledge generously and freely the work of others. Hughlings Jackson he held in special regard and he went out of his way over and over again to pay tribute to his brilliant studies of aphasia. In a clinical lecture on myelitis, Gowers took special pains to refer to "one of the most benevolent and noble-minded, as well as one of the most able physicians of the day—Dr. Hughlings Jackson". Jackson, in his turn, was always grateful to Gowers because of the manner in which he expounded the Jacksonian theories. When a bust of Jackson was gifted by his neurological colleagues to the National Hospital, Gowers presided at the unveiling ceremony and gave the appreciative address, finishing with the words "let us look upon this bust and then turn to the living counterpart—our master!"

To those among his house physicians and assistants who served him well, and who took pains to get beneath the exterior toughness, Gowers proved himself a genial and friendly supporter.* With some of them, like Langdon, Foster Kennedy and Pierce Clark in America, and Stanley Barnes in Birmingham, he corresponded for years after they had left London. With his residents he communicated largely by means of postcards, some of them written in shorthand. Thus Stanley Barnes received one to the effect, "May 28, 1902. I must thank you for your help in my lecture to-day because, for promptness and efficiency it exceeded any I remember. Pressed as I was, the service was great." Another reads: "December 10,

* An American graduate who had clerked for Gowers for three months took leave of his chief as he was proceeding to Vienna for further study. To Gowers' questions he stated that he planned to be in Vienna about a month in order to look into the cause and aetiology of disseminated sclerosis. Gowers suggested that this interested him personally as he had been studying the problem for thirty-five years, and he would be grateful for a postcard with news of what he discovered.

1902. I shall not be able to come to-morrow as I have to go to Brighton. Do you know how many there were at the lecture to-day?" A typical note is the following: "July 27, 1902. I wish you would test Mrs. Moore as to taste before she is operated upon. I fear I shall be late to-morrow afternoon—after 3. Tell Pierce Clark not to waste his time waiting. Read this reprint. I forget whether you or Singer helped. I am beginning to mix you up. I do not know whether or not it is a sign I want a holiday. Yours, W. R. G."

Most of Gowers' closest friends, however, were outside the medical profession, men of letters and achievement. The most intimate were, perhaps, Thomas Bonney* the eminent geologist, and the Reverend Augustus Jessopp,† the Norfolk rector, essayist and antiquarian. Others whose friendship he valued were Dr. Morrison,‡ *The Times* correspondent in Peking and Sir Leander Starr Jameson§ of South Africa. Sir Henry Howarth was another crony, as was the Reverend Page-Roberts, later Dean of Salisbury, whose three sons were afflicted by muscular dystrophy. Among younger friends there were Walford Davies—afterwards Master of the King's Music, and Rudyard Kipling.

He was not really a clubman and though early a member of the Savile, was rarely seen there. When, as an

* Thomas George Bonney, D.Sc., LL.D., F.R.S. (1833–1923), Professor of Geology at University College, London, and Tutor and Life Fellow of St. John's.

† The Reverend Dr. Augustus Jessopp (1823–1914), sometime Headmaster of Norwich School, afterwards Rector of Scarning, Norfolk. Antiquary, writer, social historian, he dubbed himself a "smatterer and fumbler".

‡ George Ernest Morrison (1862–1920), adviser to the President of the Chinese Republic and *The Times* Correspondent for Indo-China, Siam and Peking.

§ Sir Leander Starr Jameson, Bart. (1853–1917), a student at University College Hospital, he qualified in 1875. His health breaking down he went to South Africa and instigated the famous "Jameson Raid" in the Transvaal and later became Prime Minister of the Cape Colony.

older man, he was elected to that "philosophic dirty shirt concern called the Athenæum" he enjoyed visiting there and meeting men whose conversation was stimulating—even though the *News and Sunday Herald* had dubbed them all as "unwashed and filthy-fingered literati".

Medical meetings he rarely attended unless for the purpose of reading a paper on an express invitation. He was never a member of the Neurological Society of London which was founded in November 1885, largely because of his personal dislike of the instigator, Dr. de Watteville. For the same reason he avoided publishing his papers in *Brain*, of which de Watteville was so many years the Editor. But when the Neurological Society submerged its identity in 1907 within the new Royal Society of Medicine, Gowers was persuaded to join the Neurological Section. Two years later he delivered their triennial Hughlings Jackson Lecture.

Gowers was very much the family man and at home he became engrossed in the studies, recreations and development of his four children. He encouraged them in sports and achievements which were not open to him. However busy in his practice, he found time to take them on visits to historic buildings or on country rambles. He wrote a series of Animal Stories for their entertainment, and he also compiled a Children's Diary which he illustrated with sketches.

His health for many years was poor. After a particularly painful bout of sciatica he suffered a breakdown in 1894 to recover from which he went on a voyage to South Africa and back. Tradition relates that though enjoined to a regime of the strictest rest, he returned from this cruise with the second edition of his *Manual* re-written, corrected and ready for press. The illness left indelible marks on him, however, and he began to look older than his years. There was no trace of ageing in his

intellect, however, though his personality probably became less accommodating. At the age of 62, however, his activities gradually became more and more handicapped so as to force him into premature retirement. Leaving Queen Anne Street the Gowers family took a house in 34, Ladbroke Square. He was visited by Osler in 1913 who reported to Weir Mitchell, "You will be sorry to hear that Gowers is very ill—his own disease, ataxic paraplegia, it looks like, and ascending, so that there are now bulbar symptoms". The correct explanation is more likely to be found in a condition of generalized arteriosclerosis.

In 1914 both Sir William and his wife were stricken with pneumonia, to which Lady Gowers succumbed. He rallied, however, but his strength gradually ebbed so that the end came eventually on May 4, 1915, releasing him from a protracted and distressing ill-health.

It is interesting to try and determine Gowers' niche in the neurological pantheon. During his lifetime many honours were accorded him. He was elected a Fellow of the Royal Society at the age of 42 and was knighted ten years later, on the occasion of the Queen's Diamond Jubilee. Though never attaining high office in the Royal College of Physicians, there is no evidence that he sought such distinction. He assisted its activities as a Councillor, and ornamented its prestige as Goulstonian and Bradshaw Lecturer. He did not attain a fashionable practice nor did he leave a fortune after his demise. Court circles never granted him entry like his chief Jenner or his fellow-student Barlow. He did not receive the very highest academic prizes such as fell to Garrod, Osler and Allbutt, but his name will endure as a household word far longer than theirs. He was made an honorary Fellow of the Royal College of Physicians of Ireland, an honorary member of the American Neurological Association, the

Netherlands Society of Psychiatry and Neurology, the Russian Society of Medicine, the Royal Society of Medicine of Upsala, and of the Society of Internal Medicine of Vienna. In 1893 the Royal Medico-Chirurgical Society awarded him the quinquennial Marshall Hall Prize for the best original work in the English tongue, dealing with the anatomy, physiology or pathology of the nervous system.

A recital of such distinctions does not really help the medical historian to place him. Perhaps a better index is the assessment of what he accomplished : what new territory he traversed : and how far he contributed to the edifice of neurology as it stands to-day.

In turning over the Index of such a fully documented work as Kinnier Wilson's "Neurology" we find that Gowers' contributions to the subject are referred to in 132 separate items. What this means is shown by a comparison with other names : Oppenheim 93 ; Pierre Marie 77 ; Spiller 72 ; Van Bogaert 60 ; Guillain 56 ; Cushing 55 ; Déjérine 50 ; Marinesco 48 ; Lhermitte 45 ; Foerster 42 ; and Hughlings Jackson 21.

If we turn to the terminology of nervous disorder we cannot escape his influence. The words "amyotatic", "abiotrophy", "knee-jerk", "fibrositis", were all his coinage. Gowers' tract, Gowers' mixture are expressions in daily use to-day. In neurological therapy priority is due to him for advocating borax in epilepsy, aluminium chloride in tabes, and nitroglycerine in headache—though these remedies are largely forgotten to-day. We should never forget, however, that the early descriptions—if not the earliest—of many of the nervous diseases which we to-day recognize with confidence, are due to the acumen of Gowers : progressive lenticular degeneration ; myasthenia gravis ; ataxic paraplegia ; paramyoclonus multiplex ; Schilder's disease ; the syndrome of the sub-

frontal tumour ; musicogenic epilepsy ; geniculate herpes * ; sleep paralysis ; dystrophia myotonica ; local panatrophly † ; vasovagal attacks. Among the classical physical signs which Gowers was the first to recognize are the nasal smile of myasthenics, fixation spasm and pharyngolaryngeal nystagmus.‡ Gowers also recognized early postero-median sclerosis in the tabetic spinal cord.

Such a record has never been equalled in neurology. Comparison with Jackson is a vain pursuit, for the two great men were very different in turn of thought, in culture and in temperament. They make a perfect and harmonious pair, Jackson's vision dovetailing into Gowers' superlative gifts at the bedside ; the one a thinker and speculator, the other a diagnostician and teacher.

We may close with the challenging statement that William Gowers was probably the greatest clinical neurologist of all time.

*" Inventum medicina meum est, opiferaque per orbem
Dicor, et herbarum subjecta potentia nobis."*

—Ovid. "Metamorphoses."

*" Medicine is mine ; what herbs and simples grow
In fields and forests, all their power I know,
And am the great physician called below."*

—Dryden's translation.

* Recorded by his house physician, Stanley Barnes, in *Clin. Soc. Trans.* Vol. 36.

† Recorded by his house physician, Walter Spencer, in a letter to the *Lancet*, 1886.

‡ Recorded by Stanley Barnes.

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